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OCTOBER, 1901.

CALCIUM OXALATE CRYSTALS IN THE STUDY OF VEGETABLE DRUGS.[1]

By Henry Kraemer.

The value of the study of reserve starch grains in determining the origin of certain vegetable foods and drugs has been recognized for a number of years. It is, however, becoming more evident that the starch grains which we recognize as typical and say are characteristic of certain products occur in a relatively small proportion to the whole number of grains, *i. e.* the spherical and ellipsoidal starch grains occur in all starchy products no matter what their origin may be and the so-called characteristic grains (as the angular grain in corn, or the excentric grain with characteristic point of growth and lamellæ in maranta, potato, calumba, etc.), are by no means so numerous as is commonly supposed. So that, for instance, an examination of wheat-flour[2] which has been admixed with say, from 5 to 10 per cent. of corn meal, reveals in a microscopical mount of a milligramme of the material but two or three typical corn starch grains; and even though the admixture is about 25 per cent. only about seven typical grains will be found.

On the other hand calcium oxalate occurs in crystals of definite form and size in a large number of drugs and in only a comparatively few instances is there a distinct variation in the type, as for instance in *Datura stramonium* L.[3]

[1] Presented at the St. Louis meeting of the American Pharmaceutical Association, September, 1901.

[2] Kraemer, *Jour. Am. Chem. Soc.*, 1899, p. 650.

[3] Kraemer in *Proc. A. A. A. S.*, 1899, p. 305.

R. von Wettstein in a study of the Umbelliferæ has shown that the presence and distribution of calcium oxalate crystals are important factors in systematic work, at least in this family, and my own studies of the Solanaceæ also tend to confirm this view. It may also be noted that soil conditions do not seem to influence the amount of this salt, *i. e.* a plant growing in silicious soil will contain about the same amount as one growing in calcareous soil. I have, however, already referred to the fact that when fungi[1] are growing on plants there is likely to be a decrease in the number of calcium oxalate crystals usually present.

Calcium oxalate occurs in plants in either the monoclinic or tetragonal system. The crystals of the monoclinic system are rather widely distributed and consist of $Ca\ C_2O_4 + 3$ to 6 molecules of H_2O; while those of the tetragonal system occur less frequently and the salt has the formula $Ca\ C_2O_4 + 1$ to 2 molecules of water. It is rather interesting to note that while both forms of crystals may be obtained in even the same solution artificially, that in nature the one form or the other is constant for the species. Various explanations have been offered showing under what conditions the two forms of crystals arise. Haushoper states that the tetragonal crystals are formed in a neutral or alkaline solution, whereas the monoclinic crystals require an acid solution for their formation. Kny believes that when there is more calcium in proportion to the oxalic acid, tetragonal crystals are formed, but when the proportions are reversed then crystals of the monoclinic system arise. The observations of Kohl tend to confirm the studies of Kny.

While calcium oxalate crystallizes in these two systems, it is highly probable that but one of these systems is represented by our vegetable drugs, viz., the monoclinic system, which includes a number of forms as follows:

(1) Rosette aggregates, or what are commonly termed rosette-shaped crystals.

(2) Prisms, pyramids and elongated or irregular hexagonal-shaped crystals.

(3) Crystal-fibers.

(4) Raphides.

---

[1] Kraemer in *Proc. A. Ph. A.*, 1898, p. 297.

(5) Cryptocrystalline crystals.

(6) Membrane crystals.

1. *Rosette Aggregates* consist of numerous small prisms and pyramids or hemihedral crystals more or less regularly arranged on a central crystal and having the appearance of a rosette or star. The development of this form may be readily followed in the stem of *Datura stramonium* L. This form is more largely represented in our drugs than any other form and the following is a list of the pharmacopœial drugs in which the crystals of this class are contained, together with the size of the crystals :

Althæa, 25 microns.
Anisum, 2-3 microns.
Belladonnæ folia, occasionally.
Buchu, 15-25 microns.
Calendula, 4 microns.
Cannabis indica, about 20 microns.
Carum, 0.5-1.0 microns.
Caryophyllus, 10–15 microns.
Chimaphila, 40–60 microns.
Conium, 1–2 microns.
Coriandrum, 3–7 microns.
Cusso, about 20 microns.
Eriodictyon, 20–25 microns.
Euonymus, 15–20 microns.
Foeniculum, 1–2 microns.
[1] Frangula, 5–20 microns.
Geranium, 45–70 microns.
Gossypii radicis cortex, about 20 microns
[1] Granatum, about 15 microns.
Humulus, 10–15 microns.
Jalapa, 30–35 microns.
Pilocarpus, 20–30 microns.
Pimenta, 10 micron ; occasionally 25 microns.
Prunus Virginiana, 20–30 microns.
Quercus alba, 10–20 microns.
[1] Rhamnus purshiana, 5–20 microns.
Rheum, 50–100 microns.
Rubus, 25–30 microns.
Stillingia, about 35 microns.
Viburnum opulus, occasionally.
Viburnum prunifolium, 15–35 microns.

2. *Monoclinic Prisms and Pyramids.*—Next to the rosette aggregates the prisms and pyramids occur in the greatest number of

[1] In these drugs prisms and pyramids in group No. 2 also occur.

pharmacopœial drugs. These frequently are so modified in form that they are of an elongated or irregular hexagonal shape. The crystals of this group are sometimes mistaken for silicon[1]. Owing to the fact that the lumen of the cell in some instances is completely filled by the crystal and the inner wall having the contour of the crystal, it is impossible by simply using hydrochloric acid to determine whether the crystal has been dissolved or not. This group of crystals is found in the following drugs and in the sizes given:

Calumba, about 15 microns in stone cells.
Cardamomum, 10–25 microns.
Coca, 3–10 microns.
Eucalyptus, 15–25 microns.
Frangula, 5–20 microns.
Gelsemium, 15–30 microns.
[2] Granatum, about 15 microns.
Hamamelis, 7–20 microns.
Hyoscyamus, about 10 microns; single or in twin crystals.
Krameria, about 100 microns.
[2] Pimenta, occasionally.
Prunus Virginiana, 20–30 microns.
[3] Quassia, about 25 microns.
[2] Quercus alba, 10–20 microns.
Quillaja, 35–200 microns.
Rhamnus purshiana, 5–20 microns.
Senna, 10–20 microns.
Uva Ursi, 7–10 microns.
Vanilla, 7–35 microns.
[2] Viburnum opulus, 15–30 micron.
[2] Viburnum prunifolium, occasionally.
Xanthoxylum, 10–25 microns.

3. *Crystal Fibers.*—In quite a number of drugs a single monoclinic prism occurs in each of the parenchyma cells, adjoining the schlerenchyma fibers, and to this single longitudinal row of superimposed cells the name crystal fiber has been applied. They occur in the following drugs, the size of the individual crystals also being given:

Calamus, about 15 microns.
Frangula, 5–20 microns.

[1] Silicon never occurs as a cell content in sharp angular crystals, but occurs either in more or less elliptical or irregular hollow masses or in more or less solid irregularly branching masses.

[2] Rosette aggregates are also present in these drugs.

[3] Cryptocrystalline crystals also occur.

Glycyrrhiza, 15–20 microns.
Hamamelis, 7–20 microns.
Hæmatoxylon, 10–15 microns.
Prunus Virginiana, 20–30 microns.
Quercus alba, 10–20 microns.
Quillaja, about 35 microns.
Rhamnus purshiana, 5–20 microns.
Santalum rubrum, 7–15 microns.
Ulmus, 10–25 microns.
Uva Ursi, 7–10 microns.

4. *Raphides* was the name given by A. de Candolle (1826) to the groups of needle-shaped crystals found in various plants. These have been mistaken by several observers for calcium phosphate.[1] Usually the cells containing raphides are long, thin-walled and contain sooner or later a mucilage,[2] which arises from the cell sap and behaves with reagents much like cherry-gum. The cells are either isolated or occur in groups placed end to end, as in Veratrum viride, forming Hanstein's "Raphidenfuhrenden Schlauchgefässe." Raphides are found in the following drugs, and of the length given with each:

[3] Belladonnæ folia, occasionally.
Cinnamomum, about 5 microns.
Convallaria, about 45 microns.
Cypripedium, about 40 microns.
Ipecacuanha, 20–40 microns.
[3] Phytolaccæ radix, about 30 microns.
Sarsaparilla, 6–8 microns.
Scilla, 0·1 to 1·0 mm.
Vanilla, about 400 microns.
Veratrum viride, about 45 microns.

5. CRYPTOCRYSTALLINE crystals of calcium oxalate are exceedingly small (about ·2 to 10 microns in diameter) deltoid or arrow-shaped, and are so numerous as to entirely fill the parenchyma cells in which they occur, giving the cells a grayish-black appearance and readily distinguishing them from other plant cells. Vesque supposed that they were tetrahedrons and termed them "Sable Tetraé-

[1] Calcium phosphate is apparently seldom found in plants except either in solution or in combination with protein substance.
[2] Kraemer im *Am. Jour. Pharm.*, 1898, 225.
[3] Cryptocrystalline crystals also occur.

drique." My own investigations tend rather to the opinion that they are in the nature of hemihedral forms of monoclinic crystals. This view is strengthened by the fact that monoclinic prisms occur in neighboring cells in the same plant as in *Datura stramonium* L., Quassia, etc. Cryptocrystalline crystals are found in the following drugs:

Belladonnæ folia.
Belladonnæ radix.
Cinchona.
Phytolaccæ radix.
Quassia.

6. MEMBRANE CRYSTALS.—There are several forms of crystals which may be included in this group. The so-called Rosanoff crystals [1] consist of rosette aggregates attached to inward protruding walls of the plant cell. These, however, do not concern us so much as the large monoclinic crystals which have a membrane (called by Payen "tissu special") surrounding them. The crystal first appears in the cell-sap and then, in the protoplasm around the crystal, numerous oil globules appear; later some of the walls of the cell thicken and grow around the crystal which they finally completely envelop. Crystals of this character and of the sizes given, are found in the following drugs:

Aurantii amari cortex, 15–20 microns.
Aurantii dulcis cortex, 20–30 microns.

CARBOHYDRATE CRYSTALS.

While calcium oxalate crystals have been mistaken for crystalline sugars, it should also be pointed out that some of the more or less soluble carbohydrates, as hesperidin and inulin, may be mistaken for calcium oxalate. They occur in either sphere-crystals or irregular spherical aggregates which are more or less easily soluble in water. They are found in buchu, hedeoma, inula, lappa, pyrethrum, taraxacum and triticum.

DRUGS WITH LITTLE OR NO CALCIUM OXALATE.

In the following drugs calcium oxalate crystals are either wanting entirely or so few as to be without any diagnostic value: Aconitum, apocynum, arnicæ flores, capsicum, chirata, cimicifuga, colchici

[1] Rosanoff, in *Bot. Zeit*, 1865, p. 329.

cormis, colchici semen, colocynthus, cubeba, digitalis, eupatorium, gentiana, grindelia, hydrastis, lappa, leptandra, linum, lobelia, marrubium, mentha piperita, mentha viridis, mezereum, myristica, nux vomica, pareira, physostigma, piper, podophyllum, rhus glabra, rosa gallica, sabina, sanguinaria, santonica, sassafras, senega, serpentaria, sinapis alba, sinipis nigra, spigelia, staphisagria, strophanthus, sumbul, valerian and zingiber.

CONCLUSION.

The value of the study of the characteristic form, or absence of calcium oxalate crystals, is at once apparent when we consider the ease with which one can distinguish without question the Solanaceous leaves, horny belladonna root from inula, the genuine cinnamons, strophanthus seeds, and other drugs from those that are spurious; as also true spigelia from an adulterant which contains calcium carbonate. Examples requiring verification of this kind are continually coming up in not only the determination of powdered drugs, but crude drugs as well.

THE DETERIORATION OF ARTIFICIAL FOODS.

By Charles H. LaWall.

The deterioration or change which so often takes place in artificial foods, is a subject which is of vital importance, not only to the manufacturer who prepares the food and puts it upon the market, but also to the consumer who purchases it.

The druggist who keeps it in stock is an interested party as well as the physician who recommends its use.

In view of the fact that there are so many persons concerned in the matter, it is strange that little or nothing has been published relative to a matter of such widespread importance, but the fact remains that all of the literature on the subject is fragmentary and confined almost exclusively to technical works with which the average pharmacist or physician is unfamiliar.

The following paper is offered with the hope that a proper understanding of the principles involved will result in the instituting of such precautionary measures as will be found necessary to prevent the likelihood of possibility of such change taking place.

To intelligently comprehend the subject, some consideration

must be given primarily to the ingredients and constituents of the various artificial foods.

The constituents taken collectively may be divided into three general classes, *i. e.*:

(1) Fats.

(2) Proteids.

(3) Carbohydrates.

These may be still further subdivided according to their origin, whether it be animal or vegetable; the carbohydrates may be soluble or insoluble, that is, they may consist of sugars or dextrins, or they may belong to the group of starches.

The ingredients furnishing these constituents may be of the following:

Dried milk, flours or ground cereals, sugars or dextrins, starches, desiccated eggs or meat extracts.

The deterioration may be due to chemical changes involving one or more of these constituents or may be due to physical alterations brought about in one of several ways.

The principal causes involving chemical change may be divided into three classes, *i. e.*

(1) Oxidation of the fatty matter, resulting in what is commonly known as rancidity.

(2) Fermentative changes, which generally affect the carbohydrates.

(3) Putrefactive changes, which involve the proteid or albuminous matter.

The oxidation of the fatty matter is the only one of these changes that can possibly take place in the dry product, as both putrefaction and fermentation require the presence of a certain amount of moisture for their accomplishment.

This oxidation as it is called may be of bacterial origin, or it may be due simply to the action of the oxygen in the atmosphere. The latter supposition is borne out by the fact that this change occurs in dry material (or material containing less than 5 per cent. of moisture), is favored by access of air and retarded by protection from the atmosphere.

"Thorpe's Dictionary of Chemistry" says concerning the stability of fixed oils and fats: "If air be excluded the fixed oils may be preserved unchanged for a lengthened period; when absolutely

free from foreign matter most of them remain unchanged, but commercial specimens gradually turn rancid. This alteration is generally attributed to the presence of certain foreign matters, such as the cellular substance of the animal or plant from which the oil was extracted; volatile fatty acids are set free. Max Grager considers that rancidity is due to the oxidation of fatty acids and glycerin in presence of traces of water."

Decomposition of this kind is favored by continued exposure to high temperature, such as being placed on a shelf which adjoins a chimney flue.

Fermentative changes and alterations produced by the agency of micro-organisms are of rare occurrence unless the product has become damp, either from being packed in containers which were not thoroughly dried, or by the absorption of moisture from being kept in a damp place, or the packages themselves becoming wet through accident. Where the container is air- and moisture-proof these latter causes are eliminated from consideration.

Mould growths will take place in the presence of 10 per cent. of moisture, while bacteria will not flourish in the presence of less than 50 per cent. of moisture except in the presence of sugars, when the limit is reached with 30 per cent. of moisture.

When fermentative changes have once set in it is difficult to retard their operation.

There are some species of bacteria that will flourish after having been subjected to a pressure of 600 atmospheres for twenty-four hours, and on the other hand many of them will thrive better in the absence of oxygen than when freely exposed to the air. Fermentative changes alter the nature of the product, but seldom evolve any products of a harmful nature.

It is the putrefactive changes which are most to be feared, for they involve the nitrogenous or proteid matter and often produce toxic substances such as ptomaines, or the so-called cadaver alkaloids.

The cases in which putrefactive changes have taken place are of rare occurrence, however, on account of the large amount of moisture necessary for their successful accomplishment. Then, too, such alterations are usually accompanied by the production of sulphuretted odorous compounds which give warning of the change which has occurred. The first step in putrefaction is the peptoniza-

tion of the albuminous matter, after which the liberation of volatile fatty acids and sulphuretted gases takes place and the production of the toxic principles or ptomaines is the last step in the series of changes which take place.

It therefore follows that, if air and moisture be excluded, food products will keep for an indefinite period and this has been borne out by experimental work performed by numerous investigators on the subject.

When the package is not air tight the product should always be kept in a cool dry place, as this is the safest way to minimize the chances of deterioration occurring.

Another change which often takes place in products of this kind is one which involves purely physical processes and which is applicable also to many other substances kept in the store, such as ground drugs and spices.

This change is produced by the absorption of odorous compounds and subsequent alteration of odor and flavor, either by the close proximity of some volatile body having a powerful odor, or by the standing in an atmosphere surcharged with such odorous compounds. It is a well known fact that most drug stores have a distinctive odor, usually of an unpleasant character, and at certain seasons of the year, when naphthalene, or "coal tar camphor" as it is termed, is in great demand, some druggists have window displays in which a large amount of the product is heaped up so as to attract attention. As this compound is very volatile and of a peculiar penetrating odor it can easily be seen that when the store is closed up for the night so that there is no ventilation to carry the odor out, every container in the store which is not practically air-tight will be subjected to the influence of this vapor, and in such cases as the food products, ground spices and many of the ground drugs, enough of the odor is often absorbed to be readily appreciable to the senses for a long time afterward. A retail druggist some time ago was questioned on this subject and in reply said that he had learned this fact after losing two customers who had bought ground spices from him after he had been having a window display of flake naphthalene, and that he now handled the substance only in sealed cartons, and had also taken the trouble to rearrange his drawer stock so that the strongly odorous substances like asafœtida, camphor, etc., were kept away from such substances as ground elm bark, ground spices, etc.

There is not a single druggist in the business to-day who does not know these facts perfectly well, but many are careless about putting their theoretical knowledge to practical use, and it is only with a view of reminding them of the possible consequences of inattention to such details, that the foregoing paper is offered.

RECENT LITERATURE RELATING TO PHARMACY.

ASSAY OF PHOSPHORUS IN OILS.

After trying all suggested methods the following was found most satisfactory.

Thirty c.c. oil is treated with three times its volume of ether and to the solution 8 to 12 c.c. of a 10 per cent. alcoholic solution silver nitrate is added and the mixture well shaken. The precipitate is thrown on an asbestos filter, washed with ether, transferred to a flask. After dissipation of the adhering ether, by warming in vacuo, a mixture consisting of 10 c.c. concentrated nitric acid, 10 c.c. concentrated sulphuric acid and 10 c.c. water is added to the residue and the mixture allowed to stand an hour. It is then gently warmed until red-brown vapors cease, filtered, precipitated with ammonium molybdate, precipitate dissolved in ammonia water and finally assayed for phosphates by the usual magnesia-mixture method. Practising on known quantities of phosphorus, the yield was 90 per cent. of the theoretical.—(Dr. H. Franckel, *Ph. Post*, 1901, 117). H. V. Arny.

ANATOMICAL COMPARISON OF BERBERIS BARKS.

After lengthy histological description of the bark of *Berberis aristata*, with comparisons to the bark of other species of Berberis, W. Mitlacher (*Ph. Post*, 1901, 129), finds but slight differences in their anatomy. *Berberis vulgaris* and *B. aquifolium* have more pronounced sclerotization of the medullary rays than has *B. aristata*. In the barks of both *B. aristata* and *B. aquifolium*, hard bast is lacking in the phloem; thus distinguishing these two from *B. vulgaris*.

The most prominent marks of distinction of *B. aristata* are; preponderance of sieve tubes over parenchyma in the soft bast; presence of crystals of calcium oxalate in the medullary rays, their quantity being in direct proportion to the amount of sclerotization of the same tissue; extreme breadth of medullary rays; absence of interfascicular wood. H. V. A.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The forty-ninth annual meeting was held in St. Louis, September 16–21. At the first general meeting held on Monday afternoon, September 16, the President, John F. Patton, delivered the annual address. It was devoted to the consideration of the notable achievements of the last century in pharmacy, the progress in chemistry and its application to other branches of science. The lives and works of Dr. Rice, Dr. Squibb, and Hans M. Wilder were briefly referred to. Some of the problems in educational work were considered and Mr. Patton said that the hope of bettering the conditions for the pharmacist lies in bettering the individual. The effective work of the committee on national legislation was commented upon and the speaker in conclusion referred to the proposed Procter memorial and suggested that a Procter memorial medal be bestowed by the Association.

An interesting feature of this session was the reading of a letter from Prof. A. B. Prescott, who is visiting in London and who referred to his cordial reception at the recent meeting of the British Pharmaceutical Conference in Dublin.

At the second general session the following officers were elected: President, H. M. Whelpley; Vice-Presidents, W. M. Searby, George F. Payne and W. S. Thompson[1]; General Secretary, Charles Caspari, Jr.; Treasurer, S. A. D. Sheppard; Reporter on Progress of Pharmacy, C. Lewis Diehl. W. L. Cliffe was elected Local Secretary at a subsequent meeting of the Council. The time and place of meeting for 1902 is Philadelphia not earlier than September first. It was proposed, inasmuch as this is to be the semi-centennial anniversary of the Association, that Dr. Fr. Hoffmann, Berlin, be asked to preside at a special session and deliver an address on that occasion. The number of applicants for membership reported at this meeting was nearly 150. The remainder of this session was devoted to the consideration of the reports of officers and standing committees. The Secretary, Charles Caspari, Jr., in addition to his usual report, stated that the receipts from the sale of the National Formulary since its inception was something over

[1] William S. Thompson died very suddenly of angina pectoris on September 26th, at his home in Washington, D. C. He had not only rendered valuable service in the American Pharmaceutical Association, but was also Chairman of the Board of Trustees of the U. S. Pharmacopœial Convention.

$12,000, and that there was a profit to the Association of over $4,000. The chairman of the Committee on Membership, George W. Kennedy, reported that 102, or about 82 per cent., of the members proposed at the Richmond meeting had completed their membership. In addition an eloquent tribute was paid to the memories of Dr. Rice and Dr. Squibb. The treasurer, S. A. D. Sheppard, reported that the cash received during the year amounted to $8,595.40 and that the cash to new account was $1,379.52. C. Lewis Diehl, Reporter on Progress of Pharmacy, presented his usual report. The Committee on Credentials gave a report through its chairman, William M. Searby. The chairman of the Committee on National Legislation, Albert E. Ebert, reported the work that had been done by the committee, in coöperation with other organizations, in the successful repeal of the Stamp Tax and then moved that a permanent committee consisting of three members, one of whom should be located in Washington, and to which all matters relating to national legislation shall be referred, be appointed. The chairman of the Special Committee on Weights and Measures, Frank G. Ryan, reported that:

"During the past year some definite progress has been made toward the adoption of the metric system in the various departments of our Government. Although the final result is by no means certain another step in the right direction has been taken. The Committee on Coinage, Weights and Measures of the House of Representatives through its chairman, Mr. Southard, reported the following bill with a favorable recommendation on March 1, 1901:

"A BILL

"To adopt the weights and measures of the metric system as the standard weights and measures in the United States.

"*Be it Enacted*, By the Senate and House of Representatives of the United States of America in Congress assembled, That on and after the first day of January, nineteen hundred and three, all the Departments of the Government of the United States, in the transaction of all business requiring the use of weight and measurement, except in completing the survey of public lands, shall employ and use only the weights and measures of the metric system; on and after the first day of January, nineteen hundred and three, the weights and measures of the metric system shall be the legal standard weights and measures of and in the United States."

This bill was committed to the Committee of the Whole House on the state of the Union, and ordered to be printed. It is hoped

that it may receive consideration at the coming session of the 57th Congress.

Owing to the many changes in the membership of the House of Representatives it will be necessary to acquaint a large number of new members with the advantages to be gained by the adoption of this measure and your committee would request the active support of the individual members of this Association in an effort to convince their Representatives in Congress of the desirability of the adoption of the metric system.

Although the growth of the use of the metric system by physicians is not as rapid as we would wish, its adoption in manufacturing enterprises is certainly encouraging. While our Government at Washington has taken about thirty-four years to think the subject over, our practical business men are likely to settle the question in many lines of trade by adopting metric measurement for carrying on foreign business transactions.

The expanding foreign commerce of our country will have an important bearing upon the final outcome of the question. The advocates of the metric system have now the support of nearly all of the trade press and many of the leading daily papers actively advocate its adoption.

It is not to be supposed that the millions of dollars invested in intricate machinery is to be lost by discarding the latter and replacing with new models built on metric measurements, but a gradual change can be made and this as rapidly as demands will warrant. Probably no form of occupation using weights and measures could make the complete change with less expense than those of medicine and pharmacy. It is perfectly obvious that pharmacists can never wholly discard old systems of weights and measures until such time as physicians shall entirely abandon their use. As we have before advocated it will be necessary for our medical colleges to teach their students only in terms of the metric system, and in a comparatively brief period the change from the old to the new can be accomplished in so far as our occupation is directly concerned.

Appended to this report was submitted the complete report of the Committee of the House of Representatives which includes the bibliography of the documents presented to Congress from the year 1790 to 1896, which was recommended to the Publication Committee of this Association for printing in the proceedings.

At the third general session on Wednesday morning Joseph P. Remington, chairman of the Committee on Exhibits, presided. The entire session was devoted to short talks by those having exhibits at the meeting or their representatives. One of the most interesting exhibits was a collection of Pharmacopœias from the S. A. D. Sheppard Library of the Massachusetts College of Pharmacy. This collection consists of 275 pharmacopœias which were collected by Mr. Sheppard, in which he was assisted by the late Charles Rice and which he donated to the Massachusetts College of Pharmacy.

C. S. N. Hallberg had an exhibit of cerates, ointments, plasters and oleates representing the results of the experiments of the sub-committee on the Revision of the U.S.P., of which he is chairman. The exhibit from the Philadelphia College of Pharmacy consisted of valuable historical manuscripts and books, among which were the original notes on the Revision of the U.S.P., by the late William Procter, Jr. Albert Schneider exhibited a number of pen and ink drawings of the important characteristics of powdered vegetable drugs.

The exhibits of some of the manufacturing houses were most instructive. Parke Davis & Co. exhibited adrenalin, F. G. Ryan describing its mode of preparation and uses. Smith, Kline & French Co. had an exhibit of adulterated drugs which formed the basis of a paper by Lyman F. Kebler, which was read in abstract in the Scientific Section. The exhibit of Rosengarten & Sons was devoted to specimens of cinchona barks and the alkaloids obtained therefrom. Sharpe & Dohme had an extensive exhibit of the various pharmaceutical preparations manufactured by this firm. Merck & Co. exhibited a complete line of the chemicals which they manufacture and which elicited a great amount of attention not only on account of the variety of products but also on account of the quantities exhibited. E. R. Squibb & Sons had an exhibit of preparations in which acetic acid was used as a menstruum. The exhibit of the William S. Merrell Chemical Co. embraced a collection of the derivatives of hydrastis and oil of gaultheria. There were a number of other interesting exhibits.

SCIENTIFIC SECTION.

In order to allow those who desired to attend the memoria services in honor of President McKinley on Thursday afternoon, the work of the section was limited to two sessions; and notwith-

standing this reduction in time and the fact that the Section on Practical Pharmacy and Dispensing held a simultaneous meeting on Friday morning, the work of the section was eminently successful, the number of papers considered being more than usual. The chairman, Oscar Oldberg, delivered the annual address which we publish nearly in full.

Scientific medicine can accomplish little or nothing without the aid of scientific pharmacy. The recognition of this truth is not as pronounced and general as it might be; but, feeble as it is, it accounts for the Scientific Section of the American Pharmaceutical Association. Signs of scientific activity in American pharmacy are by no means wanting. The American Pharmacopœia is scientific and technical to a degree which gives it high rank among the pharmacopœias of the world. None of them are perfect; but the unscientific features seen in them are being gradually eliminated. The progress in medicine is rapid. The progress in pharmacy must keep pace with it. New remedies are discovered almost daily. These must be studied, analyzed, described; and means provided for their identification and examination. All of this work must be done by scientifically trained specialists—the pharmacists.

The Pharmacopœia must be understood and obeyed. It can be fully understood only by pharmacists of proper scientific-technical education. We all subscribe to the principle that the training of the pharmacist must not fall below that which is necessary to an intelligent interpretation and application of the text of the Pharmacopœia, and that as the Pharmacopœia is improved, pharmacy and pharmacists must improve with it.

The only truly practical pharmacist is the educated pharmacist. If the papers read before this Section of the American Pharmaceutical Association may be taken as a reliable index of the scientific progress of American pharmacy we would have little cause for regret. But these papers do not indicate what proportion of the pharmacists of our country are actually doing their work in a scientific manner.

During the past ten years 218 papers were read before the Scientific Section of this Association. Of these 218 papers 165 came from the pharmaceutical schools, twenty-two from the laboratories of manufacturing pharmacists, and thirty-one from other sources. Not all of the thirty-one others were practicing pharmacists. It is quite natural that a large proportion of the scientific papers read here should come from the schools and from the laboratories of manufacturers. We have a right to expect it of them. But may we not expect more than thirty papers in ten years from the practicing pharmacists of this great and progressive country? I believe that the technical knowledge and training of the members of this Association ought to bear more abundant fruit in the Scientific Section.

This Section is vitally concerned in the question of pharmaceutical education and legislation. If we do not sow the seed and diligently cultivate the ground, neither can we reap.

The most direct, simple and rational method of ascertaining whether or not a man has really prepared himself in any serious way for the responsible duties of pharmacy is to require him to state specifically what he has done in that

direction. Then, if his categorical answers show that he has actually done enough to justify the hope that he may possibly know enough to be recognized as a pharmacist, give him an examination. But the Boards of Pharmacy never ask a candidate whether or not he has ever pursued any course of study, or received any instruction, or done any work along the lines upon which the examination is conducted. They do ask the candidate if he has attended or graduated from any college of pharmacy. If he answers "yes" then they feel in duty bound to punish him with a more perplexing examination. If he says "no," then they give him a milder examination; but they never refuse to examine a candidate who may be obliged to confess beforehand that he never studied chemistry, or materia medica, or pharmacy in all his life. You might think that their object is to effectually convince the young man he ought not to insult the examiners by asking for an examination upon matters about which he ought to know that he is totally ignorant; but many of these candidates pass, become registered pharmacists, and are later called upon by the energetic friends of the American Pharmaceutical Association and invited to become members of this body.

Let us think. Is it any wonder that such men refuse to join our Association? Or that they join one year and drop out the next year? Or that they do not participate actively in our work if they do become members?

At its last annual meeting the American Pharmaceutical Association, to its everlasting credit, adopted, without a dissenting vote, a draft of a "model pharmacy law" the most important feature of which was the requirement that no person should hereafter be admitted to the rank of a registered pharmacist unless he has graduated from a pharmaceutical school. Will not the Association now go one step further and fix some kind of an educational qualification or standard of technical training for membership. We cannot consistently do less. Let us remember that the old membership which has made this Association what it is must pass away. Let us provide for the future of our dearly beloved Association by seeing to it that its coming membership shall be such as to preserve and improve it.

The strenuous method of increasing our membership in numbers is perhaps a good thing for the new members as well as for the present needs of our treasury; but let us henceforth particularly strive to enlist into our ranks as many as possible of the men who may increase the usefulness, influence and good name of our Association in the scientific direction.

Then will we have more than thirty papers in ten years from those of our members who are not engaged in teaching or in manufacturing.

I may not attempt any review of important discoveries during the past year in the sciences most intimately related to pharmacy. It is, in the nature of things, forbidden the Chairman of this Section. Yet I may be pardoned for calling your attention to the possible if not probable solution of one of the mooted questions which has puzzled the student of chemistry during recent years. The gaseous elements recently discovered in the atmosphere, for which, it was said, no place could be found in the periodic system of classification, seem to fit into that system so perfectly as to add new evidence to the truth of the periodic law, for neon, argon, crypton and xenon would seem to form one family which belongs, as another 8th group, between the halogens and their antipodes, the alkali metals:

Fluorine	Neon	Sodium
19	20	23
Chlorine	Argon	Potassium
35.5	39.9 (?)	39
Bromine	Crypton	Rubidium
80	82	85.5
Iodine	Xenon	Cæsium
126.5	128	133

With a due sense of the feebleness of my right and fitness to discuss questions of theoretical chemistry in a critical attitude I ask your attention, further, to the inconsistencies of the molecular formula and weights used in our pharmaceutical and chemical works. If we subscribe to the theory that *molecules are the smallest particles into which any particular kind of matter can be divided without losing the specific properties which determine its individuality*, we shall have little difficulty in remedying a few of the inconsistencies referred to. Avogadro's law states that equal volumes of all gases contain an equal number of molecules; but it seems to me that no one substance can have more than one molecular weight. I leave it to the masters of chemistry to say whether the law of Avogadro ought not to be qualified so as to read to the effect that *equal volumes of all gases contain the same number of individual particles of matter* (not necessarily "molecules").

Our Pharmacopœia assigns to ferric chloride the old formula, Fe_2Cl_6, and a corresponding molecular weight, whereas modern recognized authorities on chemistry give the new formula $FeCl_3$. Particles of Fe_2Cl_6 exist in the state of vapor, and also particles of $FeCl_3$ at a higher temperature. Here the old formula is inconsistent, while the new one is consistent, with the theory of atomic linking. On the other hand our Pharmacopœia writes arsenous oxide As_2O_3 although, so far as I know, that compound has not yet been obtained in vapor of a density corresponding to that formula, but has been obtained of a vapor density corresponding to the formula As_4O_6.

May it not be profitable to adopt the rule that the molecular weight of any vaporizable compound must be twice the number indicating its *lowest* possible vapor density, and that the molecular formula must be consistent with the theory of atomic linking? This question is one of interest as well as importance.

The following papers were presented:

The So-called Pure Berberine of R. Gaze.

By H. M. Gordin and C. G. Merrell.

The authors have shown that the berberine of Gaze, which is formed by first forming an insoluble compound of berberine with acetone and then liberating the berberine from this compound by boiling with a mixture of alcohol and chloroform for twelve hours under a reflux condenser, is not free berberine but berberine hydrochloride, $C_{20}H_{17}NO_4HCl + 2H_2O$. This assumption at once clears

up the puzzling behavior of Gaze's berberine. It does not absorb carbon dioxide because it is not the free base but a salt of it. It does not take up any acid when it is taken up by acid and precipitated with potassium iodide or Wagner's or Mayer's reagent, because it simply interchanges its acid with the potassium iodide falling out as a hydriodide, leaving an equivalent amount of potassium chloride in solution. Silver nitrate reacting with the potassium chloride exactly as it does with potassium iodide does therefore not show any consumption of the latter salt.

The Alkaloids of Glaucium Flavum.

By R. Fischer.

The author isolated from this plant two alkaloids, protopine, identified by analysis, m. p., and crystallographic form, and another alkaloid, undoubtedly identical with the glaucine of *Probst*, although the latter investigator dealt with a very impure substance. Pure glaucine crystallizes from ethereal solutions in large, well defined crystals belonging to the rhombic system. It melts at 119°–120° and dissolves readily in alcohol, ether, chloroform, acetone and acetic ether; in water it is but slightly soluble. Glaucine is a very weak base. It is optically dextrorotatory $[L]_d$, being + 113.3 for approximately 5 per cent. solution. Its reactions with general alkaloidal reagents are very delicate and characteristic. The preparation of crystalline gold and platinum salts did not succeed on account of the strong reducing action of the base. A crystalline mercury salt, however, was obtained, melting at 130°–140°.

The empirical formula of glaucine was declared to be $C_{21}H_{25}NO_4$. The analyses of the hydrochlorate and hydrobromate, both well defined crystalline substances, corroborated these results. Glaucine is a tertiary base, containing four methoxyl groups. The substitution product, $C_{17}H_{13}(OH)_4NHI$, was obtained as a crystalline body and described.

The Alkaloids of Eschscholtzia Californica.

By R. Fischer.

Contrary to the results of *Bardet & Adrian* the author did not find any morphine in this drug. Instead, protopine, β homochelidonine and γ homochelidonine were identified by analyses as well as by m. p. and crystallographic measurements.

The Alkaloids of Sanguinaria Canadensis.

By R. Fischer.

The author separated the alkaloids of this drug, chelerythrine, sanguinarine, protopine and β and γ homochelidonine according to a new process. Chelerythrine ($C_{23}H_{23}NO_5$), which before had always been prepared containing one molecule of alcohol, was obtained by precipitating from acid solution with ammonia and dissolving the dried precipitate in toluol, as a crystalline body melting at 263°–264°, whereas the alcohol containing base melted at 203°. Since analyses of this body gave too high results in *N*, Na_2CO_3 was used as a precipitating agent. Crystals melting at 257° were obtained, which contained one-half molecule of toluol of crystallization, and upon analysis were found to correspond best with the formula $(C_{21}H_{17}NO_4)_2$. $H_2O + C_6H_5CH_3$. The analysis of sanguinarine corresponded best with the formula of König, $C_{20}H_{15}NO_4 + \frac{1}{2}C_2H_5OH$.

Both β and γ homochelidonine were found in sanguinaria, differing in crystallographic form as well as in m. p. Upon closer investigation the author concludes that the two are undoubtedly physical isomers. Depending upon the precipitating agents employed, as well as upon the temperature, concentrations and nature of the solvent, either the one or the other of the two forms would be obtained. The change from the γ to the β homochelidonine was quantitatively accomplished. The reverse process was only partially successful. β homochelidonine melts at 159° and was never found to crystallize with alcohol of crystallization, γ homochelidonine melts at 169°. It sometimes crystallizes with, sometimes without alcohol and acetic ether of crystallization.

Does Argemone Mexicana Contain Morphine?

By Julius O. Schlotterbeck.

The author has found the alkaloids protopine and berberine, but no morphine.

Contribution to the Chemistry of Stylophorum Diphyllum.

By J. O. Schlotterbeck and H. C. Watkins.

The authors have isolated the alkaloids chelidonine, stylophine, protopine, diphylline and sanguinarine.

Separation of Cinchona Alkaloids With Ether.

By Wilbur L. Scoville.

The author has made a series of experiments with anhydrous ether (Sp. gr., 0·7201) and two lots of ether containing alcohol with a Sp. gr., respectively of 0·7250 and 0·7285, on a mixture of quinine, 0·300; quinidine, 0·020; cinchonidine, 0·150 and cinchonine, 0·150. Of this mixture 0·470 was ether soluble. The figures obtained were variable and it was shown that the alcohol in the ether has a very important influence upon the results. It was also pointed out that the separation of quinine by ether must be considered fallacious.

Creosote.

By Merck & Co.

The authors called attention to the origin and history of the use of creosote and the confusion of wood-tar creosote with coal-tar creosote and suggested in view of the increasing use of beech-wood creosote in treatment of consumption that the word creosote be applied hereafter only to wood creosote. After an interesting discussion on the paper, a resolution was passed by the Association to the effect that in view of the confusion of the name creosote, the latter should be restricted exclusively to the true wood-tar creosote.

Medicinal Plants of the Philippine Islands.

By Clement B. Lowe.

The author presented a review of a forthcoming book on this subject, which is being published by P. Blakiston's Son & Co.

Diphtheria Antitoxin.

By Joseph W. England.

The author gave a brief description of the methods of preparing and standardizing diphtheria antitoxin. Prior to the reading of the paper, L. E. Sayre, chairman of the committee appointed by the Association at the Richmond meeting to consider the advisability of asking the Committee of Revision of the U.S.P. to introduce diphtheria antitoxin, read his report which was adopted and referred to the Revision Committee.

The Alkalimetric Factors of Diacid Alkaloids.

By H. M. Gordin.

Inasmuch as in the alkalimetric estimation of alkaloids (*Ph. Arch.*, II, No. 10) the work is done in an excess of acid, the base in going out of solution ought always to carry along an amount of hydriodic acid corresponding to the highest state of basicity of the alkaloid. In the case of a monoacid alkaloid, using sulphuric acid for titration and Wagner's reagent as a precipitant, the reaction ought to go according to the equation $B_2H_2SO_4 + 2KI.I_n = 2BHI.I_n + K_2SO_4$. In the case of a diacid base, then, the reaction ought to take place as follows: $BH_2SO_4 + 2KI_n = B2HI.I_n + K_2SO_4$.

In the first case one molecule of the monoacid base carries down one molecule of the monobasic acid (hydriodic). In the second, one molecule of the diacid base carries down two molecules of the monobasic acid. But as the author has shown in another paper, berberine, even in the presence of excess of acid, is precipitated by Mayer's or Wagner's reagents, or potassium iodide along with only one molecule of hydriodic acid. The reaction in the case of berberine goes then as follows: $BH_2SO_4 + KII_n = B.HI.I_n + KHSO_4$. In this case a diacid base changes its basicity and is precipitated with only one molecule of hydriodic acid. In applying the alkalimetric method to the estimation of diacid bases it becomes necessary to establish the basicity of the alkalimetric factors of these alkaloids with regard to the amount of acid they take up when precipitated by Mayer's or Wagner's reagents.

An examination of the four principal cinchona alkaloids shows that, unlike berberine, these alkaloids, when precipitated in presence of excess of acid, take up two molecules of hydriodic acid for each molecule of the base.

Two New Methods for the Quantitative Estimation of Berberine.

By H. M. Gordin.

(1) A definite amount of the crude drug, say 20 gm., are extracted in a Dunstan & Short apparatus with hot alcohol on an asbestos plate until the alcohol comes out colorless, or nearly so. The extract when cold is made up to a definite volume, say 100 c.c., and filtered if not perfectly clear. To 25 c.c. of the filtrate one or

two c.c. concentrated sulphuric acid, previously mixed with a few c.c. alcohol, is added, the mixture diluted with ether to about double its volume and the assay finished exactly as just described. In the case of hydrastis, the rest of the alcoholic filtrate can be used for the estimation of hydrastine. For this purpose the alcohol from 25 c.c. of the alcoholic extract is distilled off till only a few c.c. are left, the residue diluted with water containing about one per cent. acetic acid and a few per cent. potassium iodide to 25 c.c. The liquid is then filtered and 12.5 c.c. of the filtrate are treated as described in a previous paper. If the liquid in which the berberine is to be estimated is a strong alcoholic extract like normal tincture of hydrastis, 20 c.c. are diluted *with four times its amount of alcohol* to 100 c.c., filtered if necessary, and 25 c.c. of the filtrate are treated exactly as above described.

This method is not well adapted to the assay of liquids containing a considerable amount of water or containing no alcohol at all, like fluid extract of hydrastis without alcohol. From such liquids, even after dilution with alcohol and filtration, sulphuric acid and ether precipitates much coloring matter besides the berberine salts, so that after the addition of potassium iodide and filtration as above described, the filtrate is sufficiently colored through the presence of the coloring matter to make the final reaction lack in sharpness. Owing to the quickness and simplicity of this assay method, it might be adopted by many even in those cases where the final reaction is not very sharp, *i. e.*, for solution of berberine salts containing much water.

But a much more exact assay method which can be used in all cases is as follows:

(2) Another method of estimating berberine in liquids containing much other matter is to separate the berberine by precipitating it as an insoluble hydroiodide, washing thoroughly with water containing a little potassium iodide and converting the moist hydroiodide into the very insoluble and beautifully crystalline berberine acetone. The latter can then be thoroughly washed with water and after drying at 105° C. to constant weight, weighed. One gm. berberine acetone is equivalent to 0.8524 gm. berberine. In order to obtain the acetone compound in a crystalline form suitable for washing it is necessary that the liquid should be warm and should contain about 33 per cent. acetone.

The Estimation of Chloroform.

By W. A. Puckner.

To 10 c.c. of an approximately normal alcoholic solution of potassium hydroxid, either free from chlorides or else of a known chloride content, and contained in a vial, add a measured volume of the chloroform-ether mixture representing 0·05–0·2 grammes chloroform,[1] stopper with a sound cork, cover with cloth and tie this down firmly, mix the two liquids by rotation, then place the vial in boiling water in such a way that at no time the contents come in contact with the cork and retain the temperature for three hours. Remove the vial from the bath, let cool, add phenolphtalein and then sufficient sulphuric acid to exactly neutralize the liquid,[2] then add two drops of potassium chromate T.S., and titrate with decinormal silver nitrate. Or if Volhard's method of estimation is preferred, add to the finished digestion 10 c.c. dilute nitric acid, an excess of decinormal silver nitrate, 5 c.c. ferric ammonium sulphate T.S., and determine the excess of silver nitrate with decinormal potassium thiocyanate. In either case 1 c.c. of decinormal silver nitrate represents 0·003969 grammes $CHCl_3$.

The Characterization and Classification of the Sesquiterpenes

By Oswald Schreiner and Edward Kremers.

In this, the fourth paper on the sesquiterpenes, the authors propose a system of classification for these hydrocarbons based on their structural relationships. According to this system they may be divided into five classes, as follows:

(1) Chain	compounds	with	four	double	bonds.
(2) Monocyclic	"	"	three	"	"
(3) Dicyclic	"	"	two	"	"
(4) Tricyclic	"	"	one	"	"
(5) Tetracyclic	"	"	no	"	"

[1] If the per cent. of chloroform in the mixture is not even approximately known, 1 c.c. may be digested with 25 c.c. normal alcoholic potassium hydroxid solution for one hour, and the residual alkali determined with normal acid and phenolphtalein, when the c.c. of normal alkali which disappeared during the digestion multiplied by 0·02977 will give the amount of chloroform contained therein sufficiently close to judge the quantity to be taken for the actual determination.

[2] This acid need not be of any definite strength; an approximately normal acid is convenient.

Each class is further divided into nuclear types, consisting of cycles of three, four, five or six carbon atoms. Such a system will include all possible compounds of the formula $C_{15}H_{24}$.

The second part of the paper is a report on some further experimental work with the sesquiterpenes.

The sesquiterpene of pepper oil has been identified as caryophyllene by preparing the characteristic blue nitrorite of this hydrocarbon.

The sesquiterpene of ginger oil is shown to be a new compound, and is designated as zingiberene. A dihydrochloride, a nitronchloride, a nitrorate and a nitrorite have been prepared.

Some further derivatives of caryophyllene were also reported on.

Comparative Pharmacological Study of Scopola and Belladonna.

By Heny H. Rusby.

This paper is a resumé of this subject and concludes that when administered internally scopola is more depressing and toxic, yet administered externally it shows almost no tendency toward absorption to the extent of producing systemic effects, but does act locally with promptness and efficiency ; in eye practice more promptly and less prolonged, and more efficiently in all the other ways experimented with, save that of the plasters, where it is slightly less efficient than belladonna. Finally, scopola exhibits a distinct superiority over belladonna root in its greater uniformity of alkaloidal percentages.

Calcium Oxalate Crystals in the Study of Vegetable Drugs.

By Henry Kraemer.

The author gave a description of calcium oxalate crystals in vegetable drugs and considered their diagnostic value. (See page 471 of this Journal.)

Oxygen as a Standard for the Gasometric Tests of the Pharmacopœia.

By C. G. Hinrichs.

The author has made careful determinations on the oxygen standard, obtained by dissolving a weighed amount of pure crystal-

lized permanganate in peroxide of hydrogen acidified by one-eighth volume concentrated sulphuric acid. Since two atoms of permanganate produce 5 molecules of oxygen gas (half from each of the permanganate and peroxide, it follows that 316 milligrams give 5 times 24 or 120 c.c. of gas under the standard condition of this system. Hence 38 c.c. oxygen gas are yielded per decigramme of permanganate. The determinations made show that the values chemically produced agree exactly with the requirements of the reduction by calculation from temperature and pressure.

The Gross and Histological Characters of Powdered Coto, Paracoto, Wintera and Canella.

By Albert Schneider.

In summing up the histological comparison of the four vegetable powders, the author gives the following distinguishing characteristics for each :

(1) *Coto.*—Granular oil globules.

(2) *Paracoto.*—Absence of above granules.

Another difference between coto and paracoto is the behavior with nitric acid (concentrated or 40 per cent.). Place a pinch of the powders upon a slide and add a drop or two of the acid. The coto turns a deep red, while the paracoto becomes yellowish, which finally turns to a dirty yellowish olive green.

(3) *Wintera.*—No oil globules or very large sclerenchyma cells.

(4) *Canella.*—Numerous bright yellow resin masses, crystals and unequally thickened sclerenchyma cells. Of course canella is at once distinguished from the other powders by its color.

The Pharmacologic Assay of Preparations of the Suprarenal Glands.

By E. M. Houghton.

The author has devised a method based upon the changes produced in the blood pressure of the corotid artery, when variable quantities of a given preparation of the suprarenal glands, dissolved in slightly acidulated water, the inert substance being removed as far as possible, are injected into the femoral or jugular vein of an anæsthetized dog or other animal.

Sea Salt.

By Joseph Feil.

The author concludes that sea salt is neither evaporated sea water nor rock salt, but is purified crude sea salt and should find a place in the U. S. P., owing to its well-established use.

Note on the Application of the Cold Nitric Acid Test for Albumen.

By F. W. E. Stedem.

The author recommends the method of Napoleon Boston which simply allows a little urine to flow into a glass tube of small calibre by capillary attraction and washing off the outside of the tube with water, and then immersing the same (holding the finger on the tube to prevent the escape of the urine) into a test tube of nitric acid. Remove the thumb or finger very carefully from the tube, allowing the gradual ingress of the nitric acid from the bottom. The greater density of acid forces the urine slowly up the tube, and the point of contact is distinctly marked in the presence of albumen by a slight but always distinct layer of coagulated albumen.

A Few Remarks on the Atomic Weight of Arsenic.

By G. Hinrichs.

The Committee for the Revision of the U.S.P. has for over a year had the question of atomic weights under consideration.

In my work just published under the title "The Absolute Atomic Weights of the Chemical Elements, Established Upon the Analyses of the Chemists of the Nineteenth Century, and Demonstrating the Unity of Matter," I have presented the results of my investigations extending over almost half a century.

The results obtained by me were illustrated before the Association by the example of the atomic weight of arsenic, a metal of special importance to the pharmacist.

Sodium pyroarsenate is a fixed, accurately weighable compound of arsenic, therefore suitable for atomic weight determination. Prof. Edgar F. Smith, of Philadelphia, has shown that it is readily and completely converted into salt by gentle heating in a current of dry muriatic acid gas.

Ten such determinations were made under Professor Smith's

direction, using up to about 3 grammes of the pyroarsenate. In the last (tenth) determination, 3224·85 milligrammes of pyroarsenate yielded 2131·68 milligrammes of salt.

Accordingly, the *analytical ratio* is

$$\frac{\text{Salt}}{\text{Pyroarsenate}} = \frac{2131{\cdot}68}{3224{\cdot}85} = 0{\cdot}66102.$$

But the chemical formula of the pyroarsenate is Na_4O_7As; its common atomic weight is, therefore, 354.

The chemical formula of salt is NaCl, and its common atomic weight is 234.

These common atomic weights are our *fixed standards*, namely, for carbon-diamond taken as 12 *exactly*, O = 16, Na 23, Cl = 35·5, and As = 75 *exactly*, without further decimals whatever.

Accordingly, our *atomic ratio* is

$$\frac{4NaCl}{Na_4O_7As} = \frac{234}{354} = 0{\cdot}66102.$$

Since the analytical ratio *agrees exactly* with this our atomic ratio to the fifth decimal place, it proves that As = 75 *exactly* in fact.

A simple calculation shows that if the atomic weight of As were 75·01, the atomic ratio would be 38 lower, that is, 0·66064.

Since none of the observed analytical ratios are that low, it is thereby demonstrated that the true atomic weight of arsenic does not depart even as much as 0 01 from the exact number 75.

The mean of all the ten determinations made shows a departure of 0·002 only from the number 75.

Accordingly the true or absolute atomic weight of arsenic is 75 *exactly*, and the experimental uncertainty is only 0·002 on the mean.

In the same manner the experimental determinations for all the chemical elements have been examined in my work above specified.

In this way the fog that has for so many years rested over the atomic weights of the chemical elements has been lifted, and the use of false atomic weights seems to be no longer justifiable.

The Iodoform Reaction in Analysis.

By Lyman F. Kebler, B. S.

The iodoform reaction has within recent years played a considerable part in analytical work, and we are generally informed that ethyl alcohol will not react with iodine in an alkaline solution to

form iodoform at the ordinary temperature. The writer, however, has found that this observation is incorrect, this being brought to his attention while examining a sample of grain alcohol, concerning which there was some doubt relative to its purity. On applying the usual iodoform reaction it is found to indicate the presence of some iodoform producing substance; but subsequent examinations fail to prove that there was anything present excepting ethyl alcohol. The same reaction was then applied to ordinary grain alcohol, and to absolute alcohol, and the same reaction was developed with both. In fact, the ethyl alcohol can be completely precipitated as iodoform at the ordinary temperature, the precipitation, however, is slow, and especially so in cooler weather.

The Chemical Composition of Calcium Lacto-Phosphate.

By Lyman F. Kebler.

Very little information exists in literature relative to this product. It is described as a white, hard, shiny, scaly crystal, yet we are sure that no one ever saw this article commercially in the above form. It is generally supposed to consist of calcium lactate, lactic acid and calcium phosphate; an excess of lactic acid being always present to render the product soluble. According to the writer's experience the presence of the lactic acid does not account for the solubility of the calcium lacto-phosphate. The reason why calcium lacto-phosphate is soluble, is because that it is composed almost entirely of soluble products—namely, calcium lactate, calcium acid phosphate, lactic acid and a small amount of normal calcium phosphate. The latter is probably rendered soluble by the presence of the calcium acid phosphate and a small quantity of lactic acid. The analytical results are tabulated and the methods employed for determining the same are included in the paper.

Cinnamon Oils and Cinnamic Aldehyde.

By Geo. R. Pancoast and Lyman F. Kebler.

The authors collected the various kinds of cinnamon oils in the market and examined them as to purity as well as estimated the per cent. of cinnamic aldehyde. From the results obtained, the authors concluded that the various kinds of oils examined complied very closely with the quality for which they were sold, and they are of the opinion that this has largely been brought about by the

method for estimating the percentage contents of cinnamic aldehyde.

The cinnamic aldehydes have always tested up well. There are some reasons, however, for thinking that it is not as stable as the oil itself.

Extract of Meat.

By Lyman F. Kebler.

The author gives in tabular form the results of a chemical and physical examination of a number of samples of extract of meat. These samples represent the best grades as well as the cheaper article, and from the chemical analysis and other observations, it would appear that the price and the quality are not always consistent. In fact, in some cases there appear to be some points in favor of the cheaper product. Some of the methods of analysis were also touched upon and pointed out that they are not of very great value in certain cases. For example, one of the points made by a certain analysist is the amount of material soluble in 80 per cent. alcohol. Now it so happens that common salt is soluble in this strength of alcohol; consequently, the larger the amount of salt present, the greater the amount of extractive, which would indicate, according to this method, that the extract of meat containing the largest amount of extractive is best. The uselessness of such a method is quite apparent.

Adulterated Drugs.

By Lyman F. Kebler.

This paper included the results of the examination of a large number of cases of adulterated drugs met with in the course of the writer's work.

The Histology and Development of the Fruit of Illicium Floridanum.

By J. O. Schlotterbeck.

Specific Gravities and Co-Efficients of Expansion of Volatile Oils.

By Oswald Schreiner and R. W. Downer.

The Influence of Synthetic Remedies on Various Urine Tests and Fallacies They Often Cause.

By F. T. Gordon.

The Quinhydrones as Plant Pigments.

By Edward Kremers.

The Committee on the Revision of the United States Pharmacopœia, through the Chairman, Leo Eliel, presented the following report:

Ung. Hydrargyri Nitratis.—There is some complaint regarding the present formula. The formula of 1870 (lard and neatsfoot oil) was satisfactory, and a return to this formula is recommended.

The *alkaloid of sanguinaria* is used to a large extent, and should be made official.

The direction to melt and soften aloes in the manufacture of *compound extract of calocynth* should be omitted.

The *resin of jalap* should be used in the manufacture of compound cathartic pills, instead of the extract.

The strength of *chlorinated lime* should be reduced from 35 per cent. to 25 per cent.

Spirit of Ammonia.—By the official method of preparation none stronger than 2 per cent. can be made in laboratory work. In order to make a 10 per cent. preparation it is found necessary to pass ammonia gas into alcohol several hours under pressure, the receiver being closed with a mercury safety tube outlet.

Salicin should be defined as a glucoside (see Voswinkel's Work, Berl. Dtschr. Ph. Ges., 1900, p. 31).

Aromatic Waters prepared with calcium phosphate precipitated do not keep as well as those made by the cotton process. The hot water process is recommended.

Mass of Mercury.—In making this the metal can be more quickly extinguished by using about three times the pharmacopœial quantity of glycerin mixed with honey of rose. The finished mass will be too soft, but can be easily hardened by placing between folds of bibulous paper for a few hours.

Wax.—The resin test for wax should be changed to direct that the alkaline solution be filtered through glass wool or asbestos (see A. J. P., 1900, p. 74).

We desire at this time to refer to the suggestions previously made by this committee, and to especially emphasize the following, deeming their character to be such as to merit your most careful consideration at this time:

(1) That granulated opium be used for the tincture and deodorized tincture of opium, and the use of precipitated phosphate of calcium omitted.

(2) Deprive the seeds of colchicum and strophanthus of their oils before the preparation of the tincture.

(3) Adoption of the formula given in the report of this committee, 1895, for sapo mollis.

(4) Standardization of essential oils as suggested, 1896.

(5) Change standard of linum, sinapis alba, and sinapis nigra, for reasons given in report, 1896.

(6) Tincture nux vomica. Returning to formula of 1880, retaining the standard strength as in the 1890 edition.

(7) Standardization of podophyllum, prunus virginiana, sanguinaria, sarsaparilla, quillaja, senega, strophanthus, 1897.

(8) The report of 1898, paragraphs 1 to 13 inclusive, are especially referred to the Committee on Revision for their consideration.

(9) The same report, referring to the report of 1896, on which no action was taken, viz.: To dismiss all tinctures having a fluid extract of the same drug official, and all fluid extracts having a tincture of the same drug official, and substitute for such tinctures and fluid extracts a 50 per cent. tincture under *distinctive title.*

(10) Paragraphs 16 and 17 of the same report, referring to spirit nitrous ether and crude carbolic acid.

(11) Report of 1899, paragraph 1, referring to present formula for cold cream.

The officers of the section for the ensuing year are: Chairman, Lyman F. Kebler and Secretary, Joseph W. England. Mr. Hallberg moved that the officers of the section consider the feasibility of either forming a standing committee or having a reporter on drug adulteration and drug market.

COMMERCIAL SECTION.

The Commercial Section held one session on Tuesday afternoon. The Chairman, Charles A. Rapelye, delivered the annual address in which he pointed out that this section was originally "planned to handle as best it might the ever present question of cut prices, or at least to restrict the consideration of that question to its proper time and place in the work of the Association. It has by the formation of the N.A.R.D. had that question taken out of its hands, leaving the section more time to consider the mercantile interests of pharmacy which are now forcing themselves upon our attention to a much greater degree than could have been foreseen at the birth of this section." He further stated that "no one will attempt to deny that great progress has been made in professional pharmacy and it has not been accomplished without constant study and application, and our treatment of the commercial problems that surround us must be upon the same lines. We must not expect that the vexed questions of the trade will solve themselves; but, if overcome, it must be by untiring application to the devising of ways

and means for their extermination, and, if we will apply ourselves to the task, success will eventually attend our efforts. So much has been said and written concerning the adverse circumstances surrounding our business that many have come to believe that no remedy will ever be found to alleviate present conditions, but persistent and well directed effort will overcome almost any difficulties. What is needed is patient and united effort against our common foe."

Thomas N. Wooten, Secretary of the N.A.R.D., made an address in which he called attention to the need of closer association with physicians and surgeons and the development of the professional as well as commercial side of pharmacy.

F. W. E. Stedem exhibited samples of circulars and other papers which have been actually used as advertising mediums during the past year by pharmacists in various parts of this country. He strongly recommended the continual distribution of samples with circulars reminding prospective buyers of the advantages offered.

J. H. Beal read a paper on the "Control of Prices" and showed contrary to his expectations that the Worcester plan is the best plan yet devised and cited numerous instances showing that it was legal.

William Mittlebach read a paper on "Containers," in which he called attention to the excessive charges not unfrequently made for containers, and a resolution was passed by the section bringing the matter to the attention of the N.W.D.A. for their consideration.

Louis Emanuel read a paper on "The Profitable Side of Pharmacy" and Frank R. Partridge presented one on "Some Commercial Aspects of Pharmacy." The following officers were elected for the ensuing year: Chairman, F. W. Meissner; Secretary, E. G. Eberle; Associates, F. B. Lillie, Charles L. Meyer and Wm. Mittlebach.

SECTION ON PRACTICAL PHARMACY AND DISPENSING.

This new section which has recently been organized held two interesting sessions, the first being held on Thursday morning when Henry P. Hynson, the chairman, read an address in which he called the attention of the members to the importance of the work of the section and the substantial aid it has received through Dr. Enno Sander in offering a cash prize of $50 for the most worthy paper

presented to this section. In a supplemental report on "Laboratory Possibilities" the chairman said:

Advanced medicine requires and stimulates advanced pharmacy.

There may be some question as to the justice or the advisability of the pharmacist undertaking the examination of pathological specimens—whether or not it is within the legitimate scope of his operations to assist in making diagnoses; but there can be no possible objection to him supplying the means for executing the processes by which conclusions are reached. Chemical apparatus, microscopes and microscopical accessories are profitable and creditable stock for the sales department, while the preparations of reagents, volumetric solutions, test solutions, microscopic stains, etc., can be prepared in his laboratory with perfect consistency and profitable satisfaction.

Physiological chemistry compasses nearly all the chemical operations of the physician and, besides the reagents purchased of the larger manufacturing chemist—for the quality and strength of which the pharmacist must be responsible—there are not a great many to be made by him, yet these should help to keep his laboratory busy.

Fehling's solution should, no doubt, be supplied in two parts, unless expressly ordered completed. The containers for these solutions and all other reagents should be glass stoppered bottles, as these add so materially to the appearance of an outfit.

Purdy's solution, at one time very popular, is occasionally called for and much of Geunzberg's test for acid hydrochloric is used, as are the solutions for the diazo reactions and the principal indicators.

Although no great variety of volumetric solutions are called for, quite a quantity of deci-normal sodium hydrate solution is sold and, while these solutions require time and care for adjustment, experience in this, as in everything else, gives facility. A standard must, of course, be at hand, and carefully recrystallized acid oxalic, the first time from alcohol, seems the most satisfactory. These solutions should be verified if more than a few days old.

Volumetric analysis is far less intricate than the uninitiated imagine and can be accomplished with fair accuracy by the average pharmacist after a moderate amount of practice. Ability to use this method of estimating opens up many interesting and profitable avenues to the retailer.

The microscope is so generally used in medicine to-day, that it is almost as necessary to be able to supply physicians stains and accessories as it is to fill prescriptions. The variety of stains is not large for ordinary demands, and not more than six or eight need be kept made up. Gabbett's stains, carbol fuchsin and methylene blue, Erlich's triacid stain, Jenner's gentian violet, hæmatoxylin-alum and Toison's dilution solution are among the more prominent. Success in their preparation depends largely upon the quality of the dry colors used. Ordinary commercial anilin will not answer. Gruebler's are the best to be had and, although comparatively expensive, can be used and still a good profit secured. Formulas for all these stains, reagents and solutions may be found in almost any modern work on pathology; "Simon's Clinical Diagnosis" is the best we have ever seen and Von Kahlden is good. Some of the processes for making them seem odd and unpharmaceutical and may, in many instanecs, be modified to advantage. Ehrlich's triacid blood stain is, perhaps,

the most difficult to prepare; the prescribed manipulation can be simplified by an accomplished pharmacist. Jenner's is simple but tedious in preparation and is becoming very popular for blood examinations.

In addition to products used in chemical and microscopical examinations others, just a little out of the ordinary, may be supplied. Physiologically normal salt solution may be kept on hand, sterilized in 500 c.c. and 1 litre Florence flasks, respectively. Salt tablets for making this solution are also popular. Thompson's bladder irrigating fluid and Muller's preserving liquid are sold in large quantities. Loefler's solution, used in diphtheria, is easily made and keeps well. Solution of adrenals, properly preserved, is in great demand. Mucilaginous lubricants for surgeons are a late requisite; Iceland moss with glycerine, is most largely used, dispensed in collapsible tubes. These lubricants must be sterile and antiseptic. Green soap, in tubes, should also be sterile. Before filling these, the screw of cap and neck should be coated with petrolatum and great care used to keep any of the soap off of the outside of tube; the reason for this is, no doubt, obvious.

Nebulizing solutions or liquids are more and more used and should be prepared by every active pharmacist. Formulas can be easily had from the manufacturers of the nebulizers and good judgment and pharmaceutic skill only are necessary to win success in their preparation.

Ability and facility in making chemical analyses and determinations are of immense advantage to the retail pharmacist doing a sufficiently large business. It is a telling advertisement to be able to examine and report upon a questioned tablet, capsulated powder or suspected solution. It is often a protection to one's self to be able to prove that doubts regarding a prescription are unfounded. Very recent instances are remembered of being compelled to examine bismuth and sugar powders, sulfonal capsules, solution of homatropine hydrobromate, tablets of cocaine hydrochloride, tablets of iron, arsenic and strychnine. It is also often a protection in business competition. When one *proves* to a customer that a competitor is supplying tincture of ferric chloride containing but 50 per cent. of alcohol, or tincture of iodine made of wood alcohol and containing but 3 per cent. of iodine, he is doing a good deal to help his business interests. Quite profitable is it when a pharmacist can go in the open market and buy chemicals and assayable products at 25 per cent. to 50 per cent. below the price of standard brands, prove their purity and worth, making, all the while, a reputation for himself and establishing a brand of his own.

These are a few of the possibilities of the pharmaceutic laboratory which I believe are not generally practiced and to which may be added many more by others with larger experience.

All this, taken in connection with the decline in specification, offers a large field for laboratory operations; enough, in an establishment doing an average business, to keep one person profitably employed during regular business hours.

In a second supplemental report, Mr. Hynson presented a collection of "Dispensing Notes" which embody the results of everyday experience in the drug store.

William F. Kaemmerer presented a paper which aroused a pro-

longed discussion on "Increasing the Prescription Work." The author stated that he has prepared a line of galenicals and with these and a number of selected drugs he calls upon the physicians and makes them aware of his facilities and ability to compound prescriptions and do professional pharmaceutical work. William C. Anderson pointed out that this paper indicated the advantage of the individual retail pharmacist in approaching the physician. J N. Hurty stated that it was science that exalts pharmacy, and the people as well as physicians should appreciate that you cannot get such perfect medicines as from pharmacists. J. L. Lemberger commended the plan in larger towns but said that in smaller towns where the physicians were personally known to the pharmacist it was not so practicable.

Henry F. Hassebrook read a paper on "Elixir Potassii Bromidi, N.F.," in which he advised the return to the use of elixir adjuvans, N.F., instead of the aromatic elixir of the U.S.P. This gave rise to a discussion on the subject of changes in the formulæ in the National Formulary. F. S. Hereth said that nothing will hurt the use of a good preparation so much as changing the formula and that care should be exercised in making changes unless essential. Caswell A. Mayo finally moved that the Committee on N.F. be requested to make no changes in colors or flavors of the preparations contained therein.

E. A. Sennewald read a paper on "Keeping Records of Prescriptions" and F. W. E. Stedem read a paper in which he called attention to some of the "Side Lines" that might engage the attention of the pharmacist.

Joseph W. England gave an "Improved Formula for Aromatic Spirit of Ammonia," as follows:

Ammonium carbonate (in translucent pieces), 500 grains; ammonia water, 2 fl. oz and 7 fl. dr.; oil of lemon, 2½ fl. dr.; oil of lavender flower, 15 min.; oil of nutmeg, 15 min.; oil of peppermint, 45 min.; alcohol, 1½ pints; water, q. s. to make 2 pints. To the ammonia water add 4½ fl. oz. of distilled water and in this mixture dissolve the ammonium carbonate reduced to a moderately fine powder. To the alcohol add the oils, then gradually the solution of ammonium carbonate. Allow the liquid to stand 24 hours in a cool place; filter, using a well covered funnel; keep the product in glass stoppered bottles in a cool place.

To this spirit oil of peppermint may be added and employed to replace "soda-mint." It may also be added to the effervescing draught of a "seidlitz powder."

Henry P. Hynson made "A Compilation of Threescore and More Prescriptions" that were presented a year ago, and these with the notes of the contributors formed the basis of an interesting discussion.

C. Lewis Diehl, chairman of the Committee on National Formulary, presented his annual report to this section which was discussed at considerable length and a special vote of thanks was tendered him.

The following officers were elected for the ensuing year: Chairman, F. W. E. Stedem; Secretary, William F. Kaemmerer; Associate, George W. Sloan.

SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.

The chairman, C. B. Lowe, in his annual address called attention to the era of good feeling which seems to prevail among pharmacists generally and to the improved trade conditions, both of which he considered to be the result of organization. He regretted that the appointment of the members of State Pharmaceutical Examining Boards is so much a matter of politics and thought that the State associations might do much toward creating a sentiment which would influence these appointments for the better. A recommendation made by the chairman was to the effect that a committee be appointed by the Association to consider the question of rescinding the right to obtain product patents to be sold under registered names, this committee to be invested with the power to procure the services of eminent patent lawyers in forming the draft of a bill to be presented to the Association at its next annual meeting and, if approved by the association, to be finally introduced into Congress.

The secretary of the section, J. A. Koch, presented a report giving statistics concerning the pharmacists of the United States and also showing the number of registered pharmacists in this country to be approximately 85,849.

J. H. Beal gave a summary of the pharmaceutical legislation introduced or enacted during the last year.

Oscar Oldberg introduced a resolution requesting Boards of Pharmacy to require from each candidate for examination a statement concerning his preliminary education. The resolution carried and the secretary was instructed to send it to the various boards of pharmacy.

A paper on "A New Economic Order in Pharmacy" was read by Harry B. Mason. Having first treated of the historic evolution of industry the author said that "the final goal towards which industry has been moving throughout all the centuries is an era of co-operation and combination of effort. . . . In the field of production we already have in the trust a long stride towards the final goal, while in the field of distribution the rapid growth and success of the department store proves the inevitable tendency."

While individualism is a more dominant factor in the professions, the author is nevertheless of the opinion that the co-operative movement has already reached them, and a number of examples illustrating this tendency in law, medicine, and dentistry were given. That this tendency has reached pharmacy is shown by the "company pharmacy" in England and Scotland and to a certain extent in several of our larger cities in this country by the corporations owning a number of stores.

In conclusion the author took a hopeful view of this tendency in pharmacy. He pointed out the economic advantages which would probably arise in this country from a system of co-operation, and said that while the professional status of the calling might be temporarily lowered, the day of the trained pharmaceutical specialist would finally make its arrival.

A paper entitled "On Teaching Microscopy, Botany, Physiology, Pharmacodynamics and Urine Analysis in Colleges of Pharmacy" was presented by Albert Schneider. Having emphasized the importance of the study of microscopy, micro-technique and botany, the author gave as his opinion that the course in physiology should be more thorough than the average high-school course and that as this course is simply a preparation for the course in pharmacodynamics, special attention should be given to the functional activities of organs in order that the physiological action of drugs may be understood. The course in general pharmacodynamics should follow, but therapeutics should be almost entirely omitted as it belongs more especially to the domain of the physician. The author also said that the subject of urine analysis has no bearing upon pharmacy whatever, it being distinctly medical in character, and that therefore the course in this branch, if given at all, should embrace the usually recognized chemical tests for normal and abnormal urine.

A. B. Stevens made some remarks on the subject of prescriptions which were in part as follows: "For several years I have used original prescriptions of physicians for the teaching of prescription reading and compounding. While this method has its advantages it also has its disadvantages. Its principal advantage lies in the actual drill which familiarizes the student with different handwritings. Its disadvantages lie in being unable to call the attention of the whole class to any peculiarities in writing, abbreviation or incompatibilities, or to point out difficulties in compounding. This disadvantage is best overcome by the aid of the stereopticon. Facsimiles of prescriptions may be easily made upon glass by covering the glass with a very thin film of old turpentine, or a little resin dissolved in turpentine. This is best accomplished by placing a drop of the turpentine on the glass and rubbing it over the surface with a piece of flannel. The film must be very thin else the ink will not flow freely from the pen. Place the glass thus prepared over the prescription to be copied and trace with India ink. Recently I have preferred to use celluloid in place of glass. It is more convenient and being thinner than glass a more perfect tracing can be made. The celluloid may be obtained in strips several feet in length and the prescriptions copied in the same manner as upon glass. Spirit of camphor may be used in place of the oil of turpentine. The strips of celluloid may be placed on rollers similar to those used in photographic cameras. For the study of incompatibilities I have copied upon celluloid, by means of a typewriter, the prescriptions given in Ruddiman's Incompatibilities. Then a certain number of prescriptions may be assigned to the class for a lesson. During the recitation the prescriptions are thrown upon the screen and members of the class are called upon to read the prescription, explain the incompatibilities, if any, also explain the method if compounded. Later the class is required to explain prescriptions not given in the textbook."

A paper on "The Liquor Laws of the States and Provinces as They Apply to Pharmacists" was read by C. B. Lowe.

The following were the officers of the section elected for the ensuing year: Chairman, E. G. Eberle, of Texas; Secretary, J. W. T. Knox, of Michigan. W. C. Anderson, of Brooklyn; Harry B. Mason, of Detroit, and Caswell A. Mayo, of New York City, were elected associate members of this Committee.

At the final general session of the Association the reports of various standing committees were read. J. U. Lloyd presented two papers, one being on the "Versatility of Dr. Charles Rice" and the other on "A Ginseng Garden." In the latter paper the author describes the ginseng garden of S. Long, of Union, Boone County, Ky. The experience of Mr. Long as recorded in his own words will be of particular interest to those concerned in drug cultivation:

"I secured first about 300 plants from the woods where ginseng naturally grows in this section of the country. These plants were taken up with great care, plenty of dirt being left on the roots. They were carried in the cool of the day from their native location to the garden I had prepared. The earth was such as I would have used for the purpose of raising onions, a rich loamy soil. These plants were set about 6 inches apart, the rows being about 6 inches from each other. I did not notice in any instance that the transplanting disturbed the early plants in the least. From these 300 plants I collected the first year about 3,000 seed. That fall when the seeds had ripened I collected from the woods about 600 more plants, which I planted in the same manner as I had done the 300 plants, making a total of 900 roots. The following spring out of the 900 roots, 800 came up making a good crop of seed. To this I will add that of the plants set out in the fall there was a greater proportion lost than of the plants that were set out in the growing season. The seeds that ripened in July, if planted at once, will come up the next spring; those that ripened later do not come up until the second spring. I cannot give the proportion of loss in sprouting. The first year's plant is a little three-leaved spindle, and the growth is very slow. As is well known, the scars left by cast-off stalks give the age of the root. I have plants in my garden that are at least twenty years of age. I am cultivating ginseng both for the root and the seed, the seed at this time being very costly, although the root only has any commercial value except for planting. I am enlarging my gardens as rapidly as possible and use all the seed that is produced, at present having none to distribute."

ARKANSAS ASSOCIATION OF PHARMACISTS.

The nineteenth annual meeting was held May 21st at Little Rock. The President, E. F. Klein, delivered an address directed principally to the beneficent influences of associations.

John B. Bond, Sr., reported for the Committee on Legislation that it had been found inexpedient to introduce before the late session of the Legislature the legislation recommended by the Association at its eighteenth annual meeting (viz., the repeal of Section 4,993 and the substitution of a small annual fee for registration; also requiring all candidates for registration, whether graduates or not, to pass an examination before the Board of Pharmacy). The

reason why no attempt was made, says the report, was that the Committee on Legislation early discovered that certain members had come to the capital cocked and primed with legislation inimical to pharmacy, as well as against the best interests of the people, which they had determined to force through. Among the many fool things that were proposed by the legislators referred to, was a clause tacked onto a medical practice bill, imposing a fine of $100 on any pharmacist or druggist who recommended a medicine, whether proprietary or not. The committee centered its work on the defeat of the clause and effected it. Unfortunately, however, the medical practice bill, which was shorn of this obnoxious paragraph, a good and wise act, was also defeated. The report gave strong praise and commendation to the Senate of Arkansas for its liberal and beneficent treatment of pharmacy. The report was received and accepted.

The following officers were elected for the ensuing year:

President, William R. Appleton; Vice-Presidents, J. H. Carnahan and J. H. Chestnutt; Secretary, L. K. Snodgrass, Little Rock; Treasurer, J. A. Junkind; Executive Committee, J. F. Dowdy, J. B. Bond, Jr., C. K. Lincoln.

COLORADO PHARMACEUTICAL ASSOCIATION.

The twelfth annual meeting was held at Manitou, June 19th. The President, C. D. Barnes, in his address, deplored the passage of the recent law compelling druggists to pay a State liquor tax of $25.

The following officers were elected to serve during the ensuing year:

President, W. L. Shockley; Vice-Presidents, D. Y. Wheeler, F. F. Whiting; Secretary, Charles E. Ward; Local Secretary, H. F. McCrea.

The place of the next meeting will be Denver, and the time will be next June.

CONNECTICUT PHARMACEUTICAL ASSOCIATION.

The twenty-fifth annual meeting was held at Branford, June 11–12. Numerous reports were read.

J K. Williams reported that during the past year no change had been made in the laws affecting pharmacists; no legislation prejudicial to their profession had been passed. The interests of the

pharmacists of the State had been carefully considered. Many bills were presented which might have caused trouble, but all had been adversely reported and had been rejected.

M. P. Gould, of New York, read a paper on "The Business Side of Pharmacy," which was followed by a spirited discussion, in which a number of members and visiting delegates expressed their opinions regarding various questions.

The officers elected for the ensuing year were: President, Charles Fleischner; Vice-Presidents, Thomas R. Shannon and A. C. Dickinson; Secretary, Charles A. Rapelye, of Hartford; Treasurer, John B. Ebbs. Seventy-three new members were elected.

DELAWARE PHARMACEUTICAL SOCIETY.

The fifteenth annual meeting was held on June 6th at Delaware City. One of the most valuable features of the meeting was an address on Pure Foods and Drugs by Professor Robin, Bacteriologist of the State Board of Health. This paper will be printed later. The following officers were elected for the ensuing year:

President, J. T. Challenger; Vice-Presidents, W. C. Taylor, Henry McDaniel and T. F. Hammersley; Treasurer, Oscar C. Draper; Secretary, F. W. Fenn, Wilmington; Executive Committee, N. B. Danforth, Albert Dougherty and T. Harry Cappeau.

GEORGIA PHARMACEUTICAL ASSOCIATION.[1]

The twenty-fifth annual meeting was held at Atlanta, May 21st. The President, M. H. Taylor, delivered an address devoted to a *résumé* of the work accomplished by the Association during the year.

A number of papers were read, among them the following: "How to Advertise the Retail Drug Business," by J. C. Kidd, Milledgeville; "On the Manufacture of Pharmaceuticals by Retail Druggists," by J. C. Persee, Atlanta; "Hydrophobia: Its Treatment, Prevalence and Prevention," by Dr. H. R. Slack, and "Turpentine," by Dr. George Payne.

The following officers were elected for the ensuing year: President, W. S. Elkin, Jr.; Vice-Presidents, J. H. Polhil, Charles D. Jor-

[1] *Nat. Drug.*, p. 194.

dan, J. E. Kidd; Secretary, C. T. King, Macon; Treasurer, J. T, Shuptrine. Brunswick was chosen as the next place of meeting, the time being May, the day to be set by the Executive Committee.

INDIANA PHARMACEUTICAL ASSOCIATION.[1]

The twentieth annual meeting was held June 5–7, at Muncie. The President, F. W. Meissner, in his address announced that an old standing indebtedness of the Association, amounting to some $1,200, had been paid during the year.

The following papers were read:

"Preventive Medication for some Drug Troubles." By E. Stahlhuth.
"Duty." By W. O. Gross.
"Emergencies." By J. N. Roe.
"The Indianapolis Association of Retail Druggists." By I. N. Heims.
"Pharmaceutical Education." By G. D. Timmons.
"Local Associations." By I. N. Heims.
"Elixirs." By J. H. Andrews.
"The Different Iron Preparations." By J. W. Stürmer.
"The London Crude Drug Market." By M. Little.

The following officers were elected for the ensuing year:

President, C. O. Prutzman; Vice-Presidents, E. W. Swadley, John Gifford, Alexander Ruh; Secretary, A. Timberlake, Indianapolis; Executive Committee, F. E. Wolcott, Otto Gross, F. L. Burton.

Anderson was chosen as the next place of meeting, C. A. Henderson, of that place, being chosen Local Secretary. Fifty applicants for membership were elected and put upon the roll, which now numbers about 750 in good standing.

INDIAN TERRITORY PHARMACEUTICAL ASSOCIATION.[2]

The seventh annual meeting was held at South McAlester, May 21st. Thirty-nine new members were elected.

L. Matthews, Miami, read a paper on the "Relations of Clerk and Employer." Mr. White, chairman, read the report of the Committee on Legislation. The report was one of progress, and an appeal was

[1] *Nat. Drug.*, p. 235.
[2] *Nat. Drug.*, p. 195.

made to the members to assist the committee with suggestions, and to aid it in its efforts to get the law pending before Congress (which the committee thought had a good chance to become a law), passed, either by personal solicitation of Congressmen or otherwise. The committee promised to secure the endorsement of the judges and officials of the Territory, and of the other associations to the bill now pending.

The Secretary was instructed to ascertain the requirements for membership in the National Association of Retail Druggists, also of the A.Ph.A., with the view of sending delegations to the next annual meetings of these associations.

The following officers were elected for the ensuing year: President, L. Matthews; Vice-Presidents, H. F. Hancock, F. C. Savage, A. R. Breeding; Secretary and Treasurer, H. D. Knisely.

Checotah was selected as next place of meeting, May 21-23 being the time.

IOWA PHARMACEUTICAL ASSOCIATION.

The twenty-second annual meeting was held in Storm Lake, July 9–11. The President, E. V. Baldwin, delivered an address devoted to a *résumé* of the important events of the year, and made a number of suggestions toward the betterment of pharmacy in that State. The report of the Secretary, F. Howard, showed the Association to be of increasing interest to the pharmacists of Iowa. The Treasurer, J. B. Webb, reported a balance in the treasury. The following papers were read:

"Is the Modern Prescription Tending Towards the Mere Specification of Proprietaries?" By J. H. Mallard and A. H. Miles in separate communications.

"The Sale of Poisons.' By Carrie Wood.

"How Can a Druggist's Wife Best Promote Her Husband's Business Interest?" Mrs. W. G. Beale, Mrs. F. Howard and Miss Lois Stevens in separate communications.

The following officers were selected for the ensuing year: President, E. B. Tainter; Vice-Presidents, Frank Shane, Howard S. Baker and E. M. Funk; Treasurer, Jno. B. Webb; Secretary, Fletcher Howard, of Des Moines; Executive Committee, F. J. Gressler, A. A. Broadie, and A. H. Miles.

It was decided to hold the next meeting at Sioux City.

KANSAS PHARMACEUTICAL ASSOCIATION.[1]

The twenty-second annual meeting was held at Topeka, May 21–23. The President, H. W. Mehl, in his address, complimented the State Legislature upon its liberality in appropriating $55,000 for a new chemical laboratory and building at the the State University at Lawrence.

H. L. Raymond presented the report of the Committee on the School of Pharmacy at the State University, in which he stated that the condition of the students, buildings, apparatus, etc., were in a greatly improved condition. The attendance was much increased and highly encouraging. The liberality of the Legislature was fittingly acknowledged, but attention was called to the unfinished condition of some of the new departments, and aid was asked for funds to complete them. The extension of the course from two to three years was recommended, and it was thought that all interests would be better conserved if this were done. The report was signed by the full committee. Professor Sayre, as a supplement to the report, called attention to the vast number of new remedies introduced during the last two years, and presented an analysis of the therapeutical character of the list (embracing in all 170 remedies).

The Committee on Legislation directed attention to the law enacted at the last session of the Legislature prohibiting the sale of morphine, cocaine and chloral-hydrate, except on the prescription of authorized physicians. The committee recommends to every druggist that the poison register be kept close at hand and that every sale of poison be scrupulously entered therein at the time of such sale.

W. E. Sheriff, Secretary of the Kansas Board of Pharmacy, presented his report of the transactions of the Board from June 7, 1900, to May 20, 1901. It announces the completion of the indexing of the names of the registered pharmacists and registered assistants, and the purchase of a case for keeping the records. A record is being kept of those (non-pharmacists) to whom licenses for sale of domestic remedies are issued. The examination of 108 drug stores, made by H. W. Mehl, shows that of the proprietors, eighty are registered. Of the remainder, eleven are conducted by registered managers and twenty-six registered clerks. Mr. Mehl found seventy-nine poison registers. Examination reports showed 117 general mer-

[1] *Nat. Drug.*, p. 194.

chants handling domestic remedies, only a few of whom had licenses. There have, however, been 131 licenses issued. Finally, the report states that there are in the state 1,451 pharmacists registered and in good standing and sixty-two registered assistants.

The following is the result of the election of officers: President, F. A. Snow; Vice-Presidents, J. W. Cookson, M. S. Ingalls; Secretary, E. E. Lair, Topeka; Treasurer, G. Gehring; Librarian, L. E. Sayre; Local Secretary, Walter Henri.

The Executive Committee, W. S. Amos, E. C. Tritsche, George Seitz, A. O. Rosser and J. R. Fay.

MAINE PHARMACEUTICAL ASSOCIATION.[1]

The thirty-fourth annual meeting was held at Portland.

President H. Boynton, of Biddeford, was unable to be present on account of illness, and his address was not read. The report of the Secretary, M. L. Porter, showed an active membership of 281. Fifteen new members were elected at this meeting. The report of the Treasurer, W. J. Drew, showed the finances of the Association to be in good condition. Percy L. Lord, President of the Maine Commission of Pharmacy, reported that the board had examined ninety-one applicants for registration during the year.

The following papers were presented:

"A Brief History of Cinchona." By J. F. Sanford.

"Our Customers; How Shall We Treat Them so as to Increase their Number?" A. G. Gilmore.

"Cinchona: History, Methods of Cultivation and Collection, Products and Alkaloids." E. T. Bowers, Lewiston.

The following officers were elected: President, F. R. Partridge; Vice-Presidents, D. P. Moulton, F. T. Crane, G. W. Wiley, Secretary, M. L. Porter, Danforth; Treasurer, W. A. Drew; Executive Committee, five officers with George W. Dorr and S. F. Clark.

MINNESOTA PHARMACEUTICAL ASSOCIATION.[2]

The seventeenth annual meeting was held June 18–20, at Lake Minnetonka. The President, B. O. Kyseth, delivered an address

[1] *New England Drug.*, p. 503; *Ph. Era*, p. 117.

[2] *Pharm. Era.*, p. 27.

devoted to the interests of the pharmacists of the State. The Secretary, E. B. Wilson, reported thirty-two applications for membership. The Treasurer, H. W. Rietzke, showed the finances of the Association to be in good condition.

"Trade Interests" was the subject of a paper by A. W. Eckstein.

The following officers were elected for the ensuing year:

President, Stewart Gamble; Vice-Presidents, Charles Weschker, Miss Anna C. Umland and M. D. Fallman; Secretary, E. B. Wilson, Minneapolis; Treasurer, H. W. Rietzke; Executive Committee, John F. Danek; A. T. Hall and J. H. Marshall.

The next meeting will be held at Lake Minnetonka, in June, 1902.

OKLAHOMA PHARMACEUTICAL ASSOCIATION.[1]

The annual meeting was held in May in Oklahoma City. The following papers were read:

"Should Purity be the Prime Consideration." By C. A. Dow.
"Knights of the Grip." By Nels Darling.
"Profits to be Derived from Window Dressing." By D. A. Boland.
"Women in Pharmacy." By Miss Minnie Wood.
"Tablet Triturates." By Wm. McCutcheon.
"Social Duties of the Pharmacist." By F. A. Wheeler.
"Soda Fountain." By J. A. Hill.
"The Pharmacist and the Physician." By John Wand.

The following officers were elected for the ensuing year: President, Fred Reed; Vice-Presidents, J. C. Burton, J. C. Hynds; Secretary, Frank Weaver, of Oklahoma City; Assistant Secretary, W. B. Wheeler, of Guthrie; Treasurer, J. M. Remington; Local Secretary, J. A. Hill.

The next meeting of the Association will be held at Enid.

SOUTH CAROLINA PHARMACEUTICAL ASSOCIATION.

The twenty-fifth annual meeting was held at Charleston, S. C., May 22 and 23, 1901. O. Y. Owings, the president, called attention to the matters of legislation and the pure food and drug law. The report of the Secretary and Treasurer, Frank M. Smith, showed a total membership of 104 as against 93 last year. The dues have been reduced from $3.00 to $1.00, but nevertheless have only been

[1] *Western Druggist*, p. 329.

paid by some of the members. E. S. Burnham, Chairman of the Examining Board, reported that six applicants had passed the Board and that twenty-three had received licenses on their having diplomas.

The meeting was concluded with a banquet in which toasts were responded to by E. F. Parker, E. S. Burnham, A. Memmin, J. E. Burke and C. W. Kollock.

The following officers were elected for 1901–1902: President, O. Y. Owings; First Vice-President, J. A. Barbot; Second Vice-President, D. F. Frierson; Secretary and Treasurer, Frank M. Smith. The semi-annual meeting will be held in Columbia.

TENNESSEE PHARMACEUTICAL ASSOCIATION.[1]

The sixteenth annual meeting of the Tennessee Druggists' Association was held at Monteagle July 17–19th. A paper on "What Pharmaceuticals is it Profitable for the Pharmacist to Make?" was read by A. B. Rains, of Columbia. B. H. Owen read a paper on "What are the Best Methods of Advertising?" He said that more than half the money spent in advertising is wasted on account of injudicious methods.

At the second day's session two honorary members were enrolled, Rev. W. D. Powell, of West Tennessee, and Daniel Champion, of Alabama. A number of papers were read, and the following officers were elected:

President, H. W. McDonald; Vice-Presidents: J. C. Treherne, J. D. Kuhn and J. J. Ingle; Secretary, W. R. Vickers; Treasurer, J. C. Ammons. Bon Aqua Springs was selected as the place for the next annual meeting.

TEXAS PHARMACEUTICAL ASSOCIATION.[2]

The twenty-second annual meeting was held in Sherman, Texas, May 14 16, 1901. The address of the President, James L. Hazlett, was devoted in particular to the consideration of the pharmacy law, and it was recommended that a committee be appointed to draft a suitable and satisfactory law. This was heartily endorsed by the

[1] *Amer. Drug*, p. 94.

[2] *Texas Druggist*, August, 1901.

Committee on President's Address. The report of the Secretary and Treasurer, R. H. Walker, showed the finances and membership of the Association to be in a healthy condition.

The following papers were read:

"Labelling, Dispensing and Delivery of Prescriptions." J. Pfeiffer gave a number of suggestions from his own experience.

"Miscellaneous Notes." W. R. Neville gave a number of practical hints on compounding prescriptions. An English physician who prescribes glycerite of lead frequently gave this as the formula:

Liq. Plumbi subacet. 1 dr.; glycerine, 2 drs.; lanoline, 4 drs. This was used in proportion, 1 dr. to vaseline 2 drs.

"Quality of Market Drugs." T. R. Keene gave the following results of the examination of a few drugs: Alcohol, twenty-two samples were examined, but three came within pharmacopœial requirements. Asafetida, out of thirteen specimens investigated, not one contained more than 42 per cent. of alcohol soluble matter; some of the highest priced gums were of the worst quality. Castor oil—twelve samples were examined, but one was adulterated (with approximately 50 per cent. cotton-seed oil).

Cream of Tartar—Four specimens from drug stores, and seven from the groceries were examined. Those coming from the drug stores were all up to standard, in every respect, but those from the groceries, were badly adulterated; two of them contained only 40 per cent. of cream of tartar and none of them over 80 per cent. The principal article used for cheapening purposes was starch. Glycerine—Five samples were examined; all were fairly good. Calomel—Nine different lots of calomel were investigated; all were satisfactory. Cocaine—Nineteen samples were examined; five of them, each from a different manufacturer, were taken from original packages. All of these five were as good as is required. The other fourteen were purchased from various retail drug stores. Four out of these fourteen were all right, but the other ten were adulterated with acetanilid from 20 to 60 per cent.

Opium—Eight samples of assayed powdered opium all conformed to the claims made upon the labels, within the reasonable limits of errors, and allowance for different processes of assay used.

Laudanum—Numerous samples of laudanum have been assayed; some from the jobbing druggists, some from the retail druggists and others from the groceries. About half of them were near enough right to show good intentions upon the part of the maker, while the balance showed all degrees of badness, down to a dark colored liquid that took a stretch of the imagination to even give it the name of laudanum.

Many other articles have been examined, more or less closely, with results that on the average compare with those spoken of above; the conclusion is that the jobbing druggists, on the whole, are supplying the retail trade with drugs of as high a grade as the retailer is willing to pay for, and that where they send out goods that are not as good as they should be it is because of the continual demand made upon them for articles that bear the name regardless of quality. The author concludes that just as soon as the retailer asks for higher class drugs, the jobbers will gladly supply them.

"Essentials Oil of the Pharmacopœia." E. G. Eberle presented a chart for ready reference of the more common essential oils, relative to their purity, production, preservation, tests, etc.

VIRGINIA PHARMACEUTICAL ASSOCIATION.[1]

The annual meeting was held at Elkton, on July 16th. The President, A. W. Eley, in his address recommended that the Association endeavor to have inserted in the new constitution of Virginia, a clause to prohibit the Legislature from passing relief bills to allow certain persons to become druggists without passing the examination.

The Secretary, C. B. Fleet, suggested in his report, that a committee be appointed to consider the advisability of the Association publishing a journal or securing a department in some journal that was already in existence. On motion, the matter was referred to a special committee and a report on it will be made at the next meeting of the Association. Mr. Fleet also suggested that the Association take some steps in assisting the Board in prosecuting violators of the pharmaceutical laws, and on motion, a committee was appointed for that purpose.

Treasurer Lumsden's report showed Association finances to be in a healthy condition.

The committee appointed at last year's meeting to make an exhibit of National Formulary preparations before the Virginia Medical Association at its late annual meeting, reported that it had prepared a most creditable exhibit of these preparations and exhibited them to the physicians in attendance. All seemed interested and the committee believed the exhibit would result in convincing physicians of the value of the National Formulary preparations.

The Committee on Legislation reported its continued effort to prosecute violators of the pharmacy laws, and the continued difficulty which they found in getting the Commonwealth attorneys to take hold of the violations and violators. An appropriation was made to assist the Committee in its programme of war against transgressors of the pharmacy laws.

At the election of officers for the ensuing year the following were selected: President, E. L. Robey; Vice-Presidents, John L. Hagan and N. B. Schmitt; Secretary, C. B. Fleet, of Lynchburg; Local Secretary, Thomas S. Howell, of Hampton; Treasurer, C. H. Lums-

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[1] *Nat. Drug.*, p. 263.

den; Executive Committee, T. A. Miller, John T. Watson and Richard Gwathmey.

Candidates for vacancies on the Board of Pharmacy: Edgar Warfield, N. B. Schmitt, G. T. Mankin, C. B. Fleet and H. W. Cole.

For the next place of meeting Old Point Comfort was selected.

THEODOR HUSEMANN.

Theodor Husemann, Professor of Pharmacology and Toxicology in the University of Göttingen, died rather suddenly on February 13, 1901, having lectured with his usual vigor on the same day.

The name Husemann has been a familiar one in medicine and pharmacy for more than a hundred years. Theodor Husemann, the subject of this brief sketch, was born on January 13, 1833, in Detmold, Germany. He received his preliminary education in the Gymnasium in Detmold and later studied medicine and the natural sciences in the Universities of Göttingen, Wurzburg, Prag and Berlin. He was assistant for several years to Professor Oltendorf, in the University of Prag and while there perfected his knowledge of the languages and of the history of the natural sciences and medicine, thereby laying the foundation for his future success in these departments. Beginning in 1856 with a paper on the Historical Study of Pediculosis, Husemann became renowned for his contributions on historical and philological, medical and scientific subjects. In the latter part of the fifties, he began his studies and researches in pharmacology and toxicology, subsequently writing a number of important papers on these subjects, among which may be mentioned: Potassium Cyanide Poisoning, Symptoms of Strychnine Poisoning, Ptomaines and their Significance in Judicial and Toxicological chemistry, [1]etc. It may be said that his work went far to lay the foundations of the scientific study of toxicology.

Husemann undertook to practice medicine in 1859 and 1860, but gave it up to devote himself entirely to his toxicological and pharmacological studies in the University of Göttingen. He began to publish a series of valuable papers on Meat Poisons and Meat Poisoning and made a reputation for himself in various poison litigations.

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[1] This paper was translated by Dr. F. B. Power from the *Arch. Pharm.*, 1881, p. 415 and appeared in this JOURNAL, 1882, p. 152.

The valuable "Handbuch der Toxikologie" which was published in 1862, was the joint work of him and his uncle A. Husemann. In 1861 he was made reporter on Pharmacology and Toxicology for the *Jahresberichte fur die gesammte Medecin*, which position he held during the remainder of his life.

In 1865 he was made "*venia legendi*" on pharmacology and toxicology at the University of Göttingen and by dint of hard work and enthusiasm became, in 1872, professor of these subjects.

Husemann was perhaps best known to scientists abroad for his remarkable work on "Die Pflanzenstoffe in chemischer, physiologischer, pharmakologischer und toxicologischer Hinsicht," the first edition being the joint work of August Husemann and himself, while in the second edition he was assisted by A. Hilger. This book is classical in character and one of the most important books that has been written along this line of investigation and has made possible the various monographs on the alkaloids, glucosides, tannins, etc.

Among his other works may be mentioned his "Handbuch der Arzneimittellehre" which was first issued in 1873 and has been for years among the important reference books of the pharmaceutical and medical students in Germany.

He was a frequent contributor to the important encyclopædic works and wrote many papers on a great many different topics including the natural sciences, philosophy, philology, as well as pharmacology and toxicology. He was known in pharmacy more especially because of his studies on aconite, blatta, false star-anise, strophanthus, on the derivation of the words syrup, drug, bismuth, etc.

Husemann was a scientist by nature and by training and always devoted his energies to the subject at hand for which he had the best opportunity for study and development. The late Baron von Mueller thought so much of him as to name an Australian genus of the Menispermaceæ after him, viz: *Husemannia pratense.* Husemann was honored by membership in many scientific societies, among which was this College. In the editorial sketch in the *Pharmaceutische Zeitung*, the editor, in summing up the various accomplishments of Husemann, says: "It is not too much to say that he was a universal genius, the like of whom is seldom seen."

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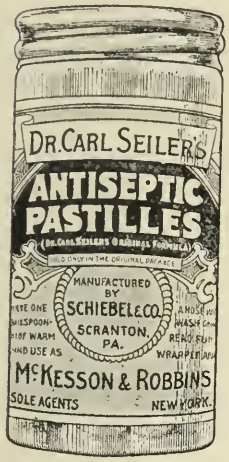
Massachusetts,	A. K. Tilden,	Boston.
Michigan,	Henry Heim,	Saginaw.
Minnesota,	H. G. Webster,	Minneapolis.
Mississippi,	S. L. Caine,	Columbus.
Missouri,	A. T. Fleischmann,	Sedalia.
Montana,	J. B. Lockwood,	Helena.
Nebraska,	N. P. Hansen,	Kearney.
New Hampshire,	G. F. Underhill,	Concord.
New Jersey,	H. A. Jorden,	Bridgeton.
New Mexico,	W. C. Porterfield,	Silver City.
New York, E. Branch,	Sidney Faber,	New York.
" " M. "	W. L. Bradt,	Albany.
" " W. "	George Reimann,	Buffalo.
North Carolina,	W. Simpson,	Raleigh.
North Dakota,	W. S. Parker,	Lisbon.
Ohio,	W. R. Ogier,	Columbus.
Oklahoma,	F. B. Lillie,	Guthrie.
Oregon,	G. C. Blakeley,	The Dalles.
Pennsylvania,	C. T. George,	Harrisburg.
Rhode Island,	H. A. Pearce,	Providence.
South Carolina,	M. H. Sandifer,	Rock Hill.
South Dakota,	E. C. Bent,	Dell Rapids.
Tennessee,	R. L. Eves,	Nashville.
Utah,	C. H. McCoy,	Salt Lake.
Vermont,	J. G. Bellrose,	Burlington.
Virginia,	T. A. Miller,	Richmond.
Washington,	J. W. McArthur,	Spokane.
West Virginia,	W. S. Hamilton,	Fairmont.
Wisconsin,	E. B. Heimstreet,	Janesville.

IMPORTANT NOTICE

DR. CARL SEILER'S
ANTISEPTIC PASTILLES

Dr. Carl Seiler's Original Formula



Numerous attempts have been made by manufacturers to furnish a tablet which, when dissolved in water, would yield a solution similar to the famous Seiler's Solution. Such preparations as have been placed upon the market yield solutions which do not represent the original preparation, and in addition cause irritation and smarting when used in the nasal cavity. Dr. Carl Seiler has consequently been compelled to request manufacturers to withdraw his name from their preparations.

The correct formula has been given by Dr. Seiler to Messrs. Schiebel & Co., of Scranton, Pa., who alone are now authorized to manufacture and use the name "Dr. Carl Seiler's Antiseptic Pastilles."

Dr. Carl Seiler's Antiseptic Pastilles

are supplied to the trade solely by McKESSON & ROBBINS, in metal screw-top bottles, each containing 50 pastilles, as per illustration shown above.

PRICES ARE AS FOLLOWS:

Lots of 1 to 3 Dozen,	=	per dozen, $3.00
Lots of 3 Dozen at one time,	=	per dozen, 2.75
Lots of 12 Dozen at one time,	=	per dozen, 2.50

The trade is cautioned against spurious preparations, and against using the name of Dr. Carl Seiler upon any similar preparation

ABSOLUTE PERFUME ESSENCES

We are placing within easy reach of dealers an opportunity to manufacture, by very simple methods, high-class French perfumes, having all the beauty and intensity for which these compositions are remarkable. The leading odors made abroad, on which French houses are staking their reputation, can be exactly reproduced at low cost by means of these aromatic principles.

Absolute essences are supplied in quantities to suit purchasers. The following odors are carried in stock :

Violettes de Russie
Violettes d'Italie (green)
English Apple Blossoms
Carnation Pink
Lilas de France
White Arbutus
Heliotrope Blanc
Indian Hay
Trefle de l'Incarnat
Rose de la France
and
Peau d'Espagne

Write for price list and descriptive circular

LEHN & FINK

Manufacturing Perfumers NEW YORK

WYETH'S
PREPARED FOOD

FOR

Infants and Invalids

PREPARED FROM

MALT, MILK AND CEREALS

NEW SCIENTIFIC RELIABLE

A food formed to meet the conditions which these two phases of life present must be chemically and physiologically adapted; the nutritive elements must be fixed and concentrated; the assimilable properties must be so adjusted that there must be a quick absorption and appropriation, and there must be no excess of substance to tax the power of digestion.

The superior of mother's milk; a combination affording the physician every advantage and embodying the established principles of infant feeding and hygiene.

Its diastasic properties prevent curdling, correct the ills of malnutrition and tone the weak and wasted organs of digestion.

Wyeth's Prepared Food is not a predigested Food, but one that will digest itself under all conditions—the Malt, rich in diastase, acting in conjunction with the pancreatic secretions, digests the fats and albumenoids of the milk, converting the starch of the cereals into sugar (Maltose) and neutralizing the tendency of the acids of the stomach to form curds—thus rendering the Food of infinite value to the infant and invalid alike, supplying the necessary nutrition and material to strengthen and build up the human economy.

Its digestive properties may be shown by simple test, the progress of conversion being readily noticeable.

PUT UP IN GLASS CONTAINERS AS FOLLOWS:

In 8-oz. bottles, 35c. size, $2.80 per doz. In 16-oz. bottles, 65c. size, $5.20 per doz. Hospital size, 6 lbs., $2.00 per bottle

JOHN WYETH & BROTHER

INCORPORATED

PHILADELPHIA, PENNA., U. S. A.

Write for copy of "Prices Current" for 1900

Every Drug Ground by Us Botanically Correct

Those that depend upon alkaloids for their medicinal value are assayed and required to come up to

STANDARD STRENGTH

Every article not perfect in all respects is rejected.

The pharmacist is assured, when using our Powdered Drugs for percolation, that his preparations will be of proper strength and free from admixtures of false or foreign matter.

Send for Price List and Formulary.

GILPIN, LANGDON & CO.

BALTIMORE, MD.

Panopepton with Iron

Contains the ferruginous element in peculiar organic combination with the peptic proteoses as formed in the peptonisation of the food proteids of the Panopepton.

The iron is bound to the food substances in a manner that cannot be accomplished by extemporaneous admixture of iron with Panopepton.

PANOPEPTON WITH IRON is put up in the same size and style of package as Panopepton "plain" and sold at the same price, $8.50 per dozen.

Fairchild Bros. & Foster

NEW YORK